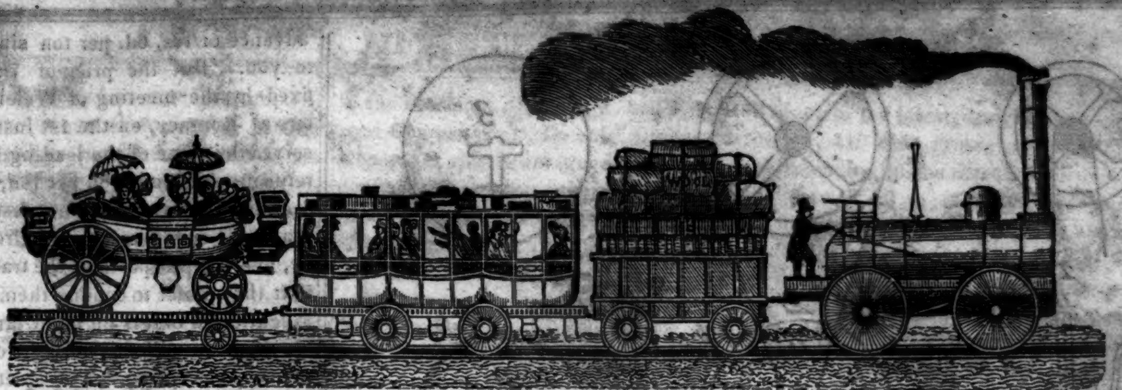


AMERICAN RAILROAD JOURNAL,

AND ADVOCATE OF INTERNAL IMPROVEMENTS.

PUBLISHED WEEKLY, AT NO. 132 NASSAU STREET, NEW-YORK, AT FIVE DOLLARS PER ANNUM, PAYABLE IN ADVANCE.

D. K MINOR, EDITOR.] SATURDAY, APRIL 30, 1836. [VOLUME V.—No. 17.

CONTENTS:

AMERICAN RAILROAD JOURNAL.

NEW-YORK, APRIL 30, 1836.

ROTARY STEAM ENGINE.—The general interest manifested not only in this country, but also in England, in the result of the experiments being made in this country with the *Rotary* Engine, induces us to refer again to the subject—which we are enabled to do more satisfactorily, as we find in the Journal of the Franklin Institute for April, the specifications and drawings of the patentees. From those drawings and accompanying description, it will be easily understood; and by the statement which we are enabled to make on good authority, it will, we trust, be judged "by its works," and not by the prejudices of those who cannot satisfy themselves as to the why, and wherefore.

That there is something about it which is not generally understood, we are willing to admit, and therefore are not surprised that there are many who not having seen it fairly tested, *doubt* its power, but as actual demonstration is all that intelligent men require to establish its superiority over the ordinary engine, it will at no distant day be duly appreciated, and generally used in all parts of the country.

We have been often asked if it would answer for engines of 30 or 40 horse power—but were entirely unable to answer the question, as experiments had not to our knowledge been made beyond 15 or 20 horse power; we are now, however, authorised to say, that engines on this principle can be made of 60, 80, or 100 horse power, and guaranteed to perform as much, and even more, with less fuel, than any other engine of the same estimated capacity.

There is one now in course of construction, with *nine* feet sweep, or four and a half feet arms, and another one contracted for, with twelve feet sweep, or six feet arms, from the shaft to the aperture—which will, when completed, settle the question, as to its being susceptible of application on a large scale—to the satisfaction of the public. Those who have watched its progress require no such evidence.

NEWBURGH AND DELAWARE RAILROAD.—We are gratified to learn that this Road from Newburgh to the Delaware River, or to intersect the New York and Erie Railroad, is now to be undertaken in earnest. An engineer, Mr. Sargent, is employed, and will enter immediately upon his duties. This is as it should be; and we hope soon to see measures adopted to continue the Road *eastward* from Newburgh or Fishkill into New England, with a view of accommodating the travel from those States to the West, via. Newburgh and the New-York and Erie Railroad. This is a measure demanding the attention of the gentlemen interested in these two, or perhaps ultimately, *one*, road.

We have frequently called attention to Avery's Rotary Engine. The following specification, from the Journal of the Franklin Institute, will place the subject fairly before the public.

From the Journal of the Franklin Institute.

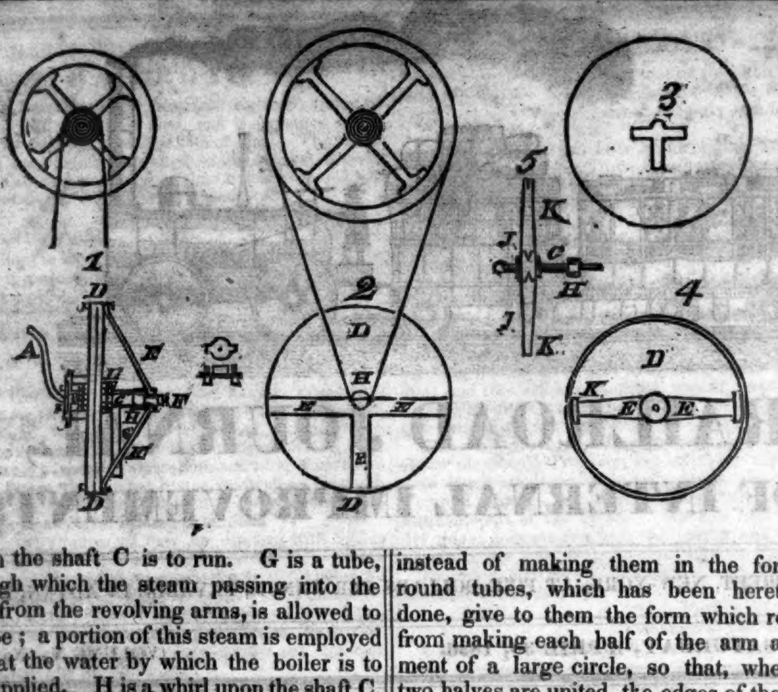
FOSTER'S AND AVERY'S ROTARY STEAM ENGINE.

We made some remarks on the subject of this engine, in the last number, and as it has attracted considerable attention, we have determined to publish the specification entire, in order that the nature and amount of the part claimed may be fully understood. This, with some further remarks upon it, was crowded out of the last number of the Journal, and, upon reflection, we have determined to omit the said remarks, and to give the specification alone. The original notice of this engine may be found at page 171, vol. ix.—[EDITOR J. F. I.]

SPECIFICATION OF A PATENT FOR AN IMPROVEMENT IN THE REACTING STEAM ENGINE. GRANTED TO AMBROSE FOSTER, BRUTUS, CAYUGA COUNTY, AND WILLIAM AVERY, SALINA, ONONDAGA COUNTY, NEW-YORK, SEPTEMBER 28TH, 1831.

To all whom it may concern, be it known, that we, Ambrose Foster, of Brutus, Cayuga county, and William Avery, of Salina, Onondaga county, in the State of New-York, have invented a certain improvement in the steam engine, commonly called the reacting engine, and that the following is a full and exact description of our said improvement.

Fig. 1, in the accompanying drawing, represents a side view of the engine, the revolving arms not being visible, in consequence of their being enclosed in a circular case, to be presently described. A is a steam tube, connected with a boiler, and forming a steam-tight joint, in the box B, where it opens into the shaft C, which is made hollow to the requisite depth. D is the edge, or periphery, of a case, or drum, within which the arms from which the steam is to issue, revolve. E, E, are braces, which may be attached to the case, or drum, and at their junction support a socket, containing a centre pin, or screw, F, against



which the shaft C is to run. G is a tube, through which the steam passing into the case from the revolving arms, is allowed to escape; a portion of this steam is employed to heat the water by which the boiler is to be supplied. H is a whirl upon the shaft C, a strap from which may be employed to drive machinery. Where the same parts occur in the other figures in the drawing, they are represented by the same letters.

Fig. 2, shows the flat side of the drum, or case; the arms, or braces, E, E; the whirl H, and the manner in which straps, or other gearing, may be carried from one wheel to another. Fig. 3, is the opposite side of the drum, or case.

E, E, in Fig. 4, shows the flat sides of the revolving hollow arms; and J, J, Fig. 5, is an edge view of the same. In Fig. 4, one side of the case is supposed to be removed, and, in Fig. 5, the whole case. At K, K, openings are made in the narrow edges of the arms, in directions opposite to each other, to allow of the escape of the steam introduced into them through the shaft C, with the hollow of which they communicate.

In an engine which we have in actual operation, the arms, E, E, (or J, J,) are each twenty inches in length. The width of the arms at the centre is about six inches, and at the ends about two and a half inches; in depth, or thickness, they are about one and a half inches, near the centre, and about three-fourths of an inch near the end. The size of the holes through which the steam escapes, is about one-quarter, by one-eighth, of an inch. The holes are so perforated that the steam shall issue at right angles with the shaft.

We have found this engine to act with great power, but do not intend to confine ourselves to these particular proportions, as we mean not only to vary the size of our engines, but also the relative proportions of their respective parts, according to circumstances.

L, L, are parts of stuffing boxes, employed to prevent the escape of steam, in a manner well known to machinists.

We find it to be a point of great importance to give such a form to the revolving arms, as shall subject them to the least possible resistance from the air; we, therefore, instead of making them in the form of round tubes, which has been heretofore done, give to them the form which results from making each half of the arm a segment of a large circle, so that, when the two halves are united, the edges of the tube present acute angles. The tubes, however, may be made elliptical, or oval, and the same end will be, in a great measure, attained. We use any number of such arms on the same shaft, as we may find best adapted to our purpose.

We do not claim to be the inventors of the reacting steam engine, nor of the case, or drum, within which we intend the arms shall, in general, revolve; but what we claim as our invention, is, simply, the giving the oblate, or flat, form to the revolving arms, so that, in proportion to their capacity, they shall experience much less resistance from the air than that to which they have been heretofore subjected, thereby obtaining a greatly increased power.

AMBROSE FOSTER,
WILLIAM AVERY.

To the Editor of the Railroad Journal.

London, December 19th, 1835.

DEAR SIR,—I observe, by your Journal of the 21st November, that you have published my communication dated London, October 9th, and as it appears, you attach some importance to information respecting Railway Iron, I will now continue my notice of this article from the date of my letter up to the present time.

In my last letter you will recollect I mentioned that the following advances in price had taken place in common (Welch) bars, viz:

On 25th August the price at Newport and Cardiff was, per ton,	£5 10s.
On that day the manufacturers advanced the price - -	10s.
September 12th they advanced it again - - -	10s.
October 2d, " "	10s.
December 1st, " "	12s. 6d.
	£2 2s. 6d.
	£7 12s. 6d

Thus you see there has been a further advance of 12s. 6d. per ton since my letter to you. But the price of 7*l*. 12*s*. 6*d*., as fixed by the meeting of Welch Iron Masters at Romney, on the 1st inst., is not observed by some of the leading houses, who refuse to sell under 8*l*. per ton, and others decline orders at all, for the present, alleging that their engagements are already so heavy, and the prospects of the trade are such, that they prefer to confine themselves to the execution of orders on hand, and thus enable them to take advantage of increased prices in the spring. The meeting at Romney adjourned to assemble again on the 12th January next, when it is confidently expected the price of 8*l*. will not only be generally confirmed, but that a further advance of 10*s*. will be agreed to. The iron market is in a most extraordinary state; the demand is far greater than the supply, which it is impossible to increase immediately, owing to the inability to obtain competent workmen to mine the coal, iron stone, and limestone, and to manufacture them into iron when procured. Aid cannot be expected from the lead, copper, tin, and other manufacturers of metals, which would be practicable if these branches were in a depressed state, but so far from this being the case, these trades are in nearly as flourishing a condition as the iron trade. Hitherto the iron masters always considered themselves fortunate, if they could get through the winter without a decline in price, *now, in the month of December*, the effort of the most judicious among them is to prevent too frequent and too great advances of price, which they deprecate, lest consumption should be checked, and also, what they fear more than any thing else, the workmen should combine and "strike" for higher wages.

You may inquire what effect has been produced on railway iron. I can answer, by quoting my own experience. I have within a week received an order for a very large quantity, (so large that I have not revealed it to any one lest it should affect the market,) of railway iron, from America. I have issued my circulars to all the houses in this line, and I find a most wonderful alteration in the tone of their communications; formerly they were all eagerness to give an answer by return of mail, and they manifested the greatest anxiety to secure the whole order, or as much of it as possible. Now some of them decline making tenders altogether, owing to the magnitude of engagements on hand; others, rather than break off connections, mention such high prices for very small parts of the total quantity wanted, that they think they will not be accepted. A decided indisposition is manifested to come under any further engagements, unless at exorbitant prices, until it is ascertained what will be the result of the adjourned meeting at Romney on the 12th proximo. I very much fear that the same pattern of rail, which I put out in the

middle of September last at 8*l.* per ton, will not now be contracted for under 10*l.* per ton, but I will do my best to screw them down to the lowest price. Notwithstanding the present high price, I have every reason to believe that prices will be still higher in the spring, for since I wrote to you I have traversed the whole iron region, visiting every establishment of any importance, and every where I found an activity and bustle which I never before witnessed during my long experience in this business. Every establishment is full, to excess, of orders, and the greatest exertions are making, day and night, to execute them. The Pacha of Egypt's order for about 5,000 tons for the railway across the Isthmus of Suez, is about one half completed; but others pour in from France, (there are two recently from that country for about 6,000 tons,) from Germany, Belgium, America, and every part of this country, in a way to astonish even the most enthusiastic friends of the Railway System. Besides this demand for railway iron, the consumption of other kinds of iron fully keeps pace with it. This country being in a more prosperous condition, and every branch of trade, cotton, silk, wool, flax, hemp, tin, lead, copper, &c., being more flourishing than at any period since the termination of the Napoleon wars, it is reasonable to suppose, and such is the fact, that iron, which is the foundation upon which the arts of civilized life rest, should be in great demand, when all other branches of industry flourish. Hence the demand for domestic consumption for ordinary purposes is very great, which when added to the demand for foreign countries, and railway purposes, you may easily imagine will readily account for the present prices, and the prospect of still higher in the spring, unless war or some other calamity should ensue to check the brilliant progress of civilization arising from the long continuance of peace. Most sincerely do I trust that you and I will never live to see another war carried on,—particularly do I deprecate a war with France,—our old ally, one of our best customers, and who ought to be our best friend. A war with that country would be little short of insanity,—it would interfere with the prosperity of both countries in a most melancholy manner, and nothing but empty, worthless glory, would result to either party. I most sincerely hope so great an evil will be averted.

I am, dear sir, very respectfully
and truly, yours,
GERARD RALSTON.

To the Editor of the Railroad Journal.

MONTREAL, 29th March, 1836.

Sir:—The communication of S. D., in your Journal of the 13th Feb., has recalled my attention to two Reports hastily perused some time since. I refer to Mr. Campbell's Report, published in your Journal of the 26th Dec., 1835, and Mr. Seymour's Report to the President of the N. Y. and Erie Railroad Company. S. D. only alludes to the Report of the latter gentleman, and has confined himself to general remarks, and I now offer you the following observations on some of the detailed statements of that gentleman.

Mr. Seymour states, "that one of the American locomotives, weighing $8\frac{1}{4}$ tons, will draw upon a level road 200 tons of freight, at the rate of ten miles per hour; that the same engine will draw, upon an ascent of 25 feet per mile, 100 tons," and so on. The rise which doubles the traction being stated at 25 feet per mile, gives us at once the power equal to the $\frac{1}{211}$ of the load, and supposing the engine to act by $\frac{4}{5}$ of its weight on the driving wheels, and assuming the adhesion equal to the $\frac{1}{12}$ of the weight, we have $\frac{4\times 8\frac{1}{4}}{5\times 12}\times 211 = 119\cdot 5$ tons *gross*, instead of 200 tons *freight*, and even this, only by taking every thing in the most extravagantly favorable light, for the weight on the driving wheels, is in general, only $\frac{2}{3}$ of the weight of the engine, and the adhesion assumed at $\frac{1}{12}$, is far above the average, in all states of the rails.

Again, Mr. S. observes, that "about the year 1829, it had not been supposed to be practicable to ascend with locomotive engines with loaded trains, upon grades exceeding 30 feet to the mile," etc. Now it is subsequently stated by Mr. S. himself, that at this day, with the most improvdd engine, only half a load can be taken up an ascent of 25 feet per mile. This passage I have quoted verbatim, above. The *absolute* load taken up any given ascent, is of course greater with engines having the advantage of the latest improvements, and the still greater advantage of the enormous addition to the weight, which is becoming almost universal, but the *relative* load differs but little from what it was six years ago, and the first tolerably constructed engine would have taken half *its* load up an ascent of 25 feet per mile, which is as much as the best will do now, according to Mr. S., which agrees with practice. Great improvements have and will continue to be made, in the mechanical construction, in avoiding fractures, rendering the parts less liable to wear, diminishing the quantity of fuel, etc., but as long as they draw by the adhesion of the wheels, only so long will the trifling ascent of 25 feet, or on well constructed roads with good carriages, about 22 feet, per mile diminish the power of the engine one half. Unfortunately, the adhesion of the wheels to the rails forms the limit of the power of the locomotive as at present used, and this limit is soon reached, and any even tolerable engine will, if the load or ascent be sufficiently great, cause the wheels to turn without advancing the train. Baldwin's engines are, I believe, generally admitted to be at least equal to any made in this country or in England, and I have known one of his latest, draw about 80 tons freight, say 110 tons gross, on a road greatly descending in the direction of the load, at the rate of 10 to 12 miles per hour, with the exception of half a mile on a straight line, which ascended at the rate of 26 feet per mile, and was with difficulty overcome by the combined action of the momentum of the train, by great diminution of the velocity, and by an immense addition of power produced by throwing a large portion of the weight of the tender on the driving wheels. By this simple expedient, the power of engines may be much increased, but it is utterly ruinous to our wooden superstructures, few of which are able to bear the action of a 6 tons engine, without injury, as is only too well known. This expedient is, I believe, due to Mr. Baldwin's, and would, were any proof wanting, be alone sufficient to show the very narrow limits of the powers of locomotive engines.

Mr. S. also speaks of avoiding the faults of the English engineers in "forcing" a line within certain limits as to grades and curvatures, at great expense. That this would be a fault as applied to many of *our* Roads, I readily admit; but if *we* could afford the capital as *they* can, then would our present cheap, temporary modes of construction be faults indeed; and, even under existing circumstances, could the Erie Railroad be so graded as to have no ascent in coming from the lake to the city, and no descent in the same direction greater than 18 feet per mile, it would, at the end of ten years, be a better investment for 20 or 30 millions of dollars, than as at present contemplated, for 5 millions. It is well known that this is impracticable, and I merely suppose this case to illustrate my position, that the power of locomotives on inclinations is much overrated, or perhaps, more correctly speaking, not understood by many who have much at stake on the successful solution of these very questions.

In the Report of the Baltimore and Ohio Company of '31, the traction is estimated at $\frac{1}{150}$, and allowing for unavoidable imperfections at $\frac{1}{400}$ of the weight, and yet now in '36, it has increased to $\frac{1}{211}$! Then, a car, was in equilibrio with gravity on an inclination of 13.2 feet per mile, now it requires 25 feet per mile to overcome the friction, which was then reduced by the use of friction wheels, and cars thus fitted up were recommended in the *strongest* possible terms, and the results of experiments given, apparently so decisive, as to lead irresistibly to the conclusion, that implicit reliance might be placed on them. Here then, after 4 years experience, after experiments and patents innumerable, are we far, very far, behind what we were in '31, as publicly announced at that time by the Engineer and Directors of the B. and O. Company. It is impossible to conceive a stronger case than this, of the caution with which these flattering statements should be re-

ceived, and right glad shall I be to learn, that an engine weighing $8\frac{1}{4}$ tons will draw 50 tons freight upon an ascent of 25 feet per mile, 10 miles per hour, as the average performance—just half the reputed performance of the Baltimore engines. How much have these extravagant statements done to shake the public confidence in that noble undertaking which has scarcely advanced 5 miles in as many years, and which is now indebted for its chance of ultimate completion, to the spirit and energy with which similar and rival works are undertaken in other States, and from which Baltimore has at length derived that confidence in the Railway system, with which her own exertions had failed to inspire her.

Mr. Campbell states, that one of "Baldwin's engines will take from 70 to 80 tons freight, 10 to 12 miles per hour, up an ascent of 45 feet per mile." If this assertion refer to an engine of about 8 tons weight, then does it far exceed what the B. and O. Company profess to do—I say *profess* to do, for the performances recorded by Mr. Seymour are mere fractions of the above, and, even the greatest (150 passengers) is not more than $\frac{1}{8}$ of what the engines are said to be capable of doing, and is rather below the average performance of the Hudson and Mohawk Railroad. On this Road, English and American engines take 50 tons gross, 15 miles per hour, overcoming an inclination of 26 feet per mile, for about $\frac{1}{3}$ the distance run. The engines weigh about $7\frac{1}{2}$ to 8 tons, and their average performance, as well as the extraordinary performance of Baldwin's engine mentioned above, are both within the limits of locomotive power, as stated in the beginning of this communication, though the performances recorded by the two gentlemen quoted above, go very far beyond them.

Of course, Baldwin, or any other good manufacturer, *can* make an engine which will take 80 tons freight up ascents of 40 to 45 feet per mile, at the rate of 10 miles an hour, but it must be a very different thing to one of Baldwin's ordinary engines, of about 8 tons weight, to which the general reader naturally supposes M. C. refers; and I think it at least doubtful if on any road the average performance of the engine is equal to 40 tons freight, drawn 10 to 12 miles up an ascent of 25 feet per mile, by a 7 to 8 tons locomotive. I need scarcely observe that the average useful effect for weeks and months together is that which is alone useful to the public, and on which the calculations of the capacity of engines should be founded, for it is well known to all who have any acquaintance with machinery, that nearly twice the ordinary amount of work can be turned off, *for a short time*, without injury to the machine, though were this attempted to be kept up, its durability would be comparatively trifling, a most important consideration in locomotives, the first cost of which is very great. My immediate object in troubling you with this communication is, that these, (as I think,) extravagant statements are more than any thing else, calculated to injure the cause of internal improvement, by being ultimately productive of mortification and serious loss to those embarking in enterprises founded on such data, by undermining the confidence of the public in the profession, and by leading inevitably to a hasty and imperfect system of location, the natural consequence of the light manner in which these heavy grades are spoken of.

In conclusion I beg leave to state, that I shall be much pleased to be proved in error as to the power of locomotives, and should any of your numerous contributors undertake the task, it will be received with the spirit in which this is offered,—that of seeking the truth.

Your obedient servant,

C. R. W.

☞ The Directors of the Detroit and St. Joseph's Railroad Company, have ordered, from England, the Iron for 40 miles of the road; being 720 tons, the cost of which will be about \$60,000—\$1500 a mile.

The grubbing and clearing on the part put under contract has been commenced, and will probably be finished by the 20th of May, the time stipulated in the contracts. We presume the iron will be received early in the fall or the latter part of summer.

The contracts for grubbing the first 15 miles of the Detroit and Pontiac Railroad, were let last Monday.—[Detroit Journal and Advertiser, May 3.]

We find the following article in the National Intelligencer, and as it relates to a subject of interest to many of our readers, we give it a place in our columns:—

We republish the subjoined article from the "Southern Patriot." When the arrangement for the survey of this great railroad was announced in the Columbia Telescope, we were aware that there was some misunderstanding in the case, as we knew the rule of service to be not to place the chief of the party of U. S. engineers in subordination to the civil engineers of any State or Company, but that when States or Companies had chief engineers, and U. S. engineers were associated on the same duty, the chief of the latter was allowed to be placed only on terms of equality with the former, receiving, like the former, his directions from the State or Company, and, like the former, making his reports and returns to the same authority.

The misunderstanding of these relations, in the associated service of private and U. S. engineers, and which had been inadvertently adopted in the preliminary arrangements for the survey of this road, by the authorities of the State of South Carolina, is now, we perceive, happily corrected.

The compliment paid by the "Southern Patriot," to Captain Williams, of the corps of topographical engineers, is, we understand, no more than the known science, great intelligence, experience, and industry of that officer justly entitle him to.

We lately observed to have been laid before Congress a report from Captain Williams, said to be a very able one, of a survey made by him for a ship canal around the Falls of Niagara. The report also embraces a plan of the work and an estimate of its cost. The whole, together with the drawings, has been ordered to be printed; and some time or other we shall give our readers some further account of the report, &c.

"Charleston and Ohio Railroad.—Capt. Williams, of the United States topographical engineers, arrived here in the steamboat from Norfolk, on Saturday. The officers to be associated with him in the survey of the proposed railroad, (viz. Lieutenants White, Dayton, and Reed, and Mr. Featherstonhaugh,) reached this place a short time since, so that the brigade is now full, and we are gratified to learn that these officers will enter immediately on the great work. Captain Williams, who is at the head of this corps, is, we understand, a gentleman of distinguished talents, of much experience, and admirably qualified for conducting the surveys about to be made; and all the officers under his command are gentlemen of high reputation, well qualified for the important duties which will devolve upon them.

We understand that Colonel Gadsden, and Captain Williams, as the chief, civil and military engineers, will, with General Hayne chairman of the commissioners, constitute a Board to arrange the measures to be adopted for the early and successful completion of the necessary examination, surveys, and estimates, to enable the Knoxville Convention, (which will assemble on the 4th of July next) to act efficiently upon the subject. Captain Williams will leave here with his party, (indeed, two of his officers have already gone,) for the mountains in a day or two, and will enter upon his work as soon as the necessary arrangements can be made. The best wishes of the citizens of Charleston go with them, and we know that it is only necessary to give this intimation to our fellow citizens of the interior of the approach of such visitors, to secure for them only a hospitable reception, but a cordial welcome, and the most *efficient aid.*"

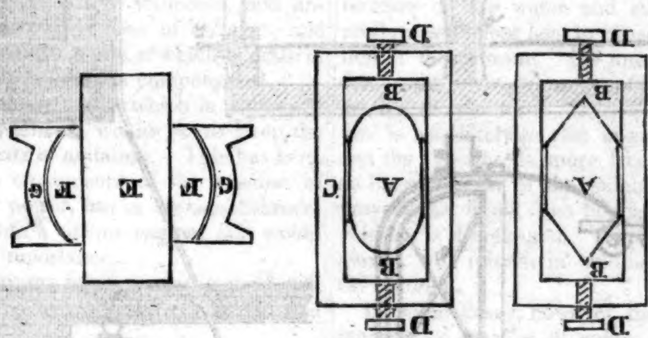
[From the Journal of the Franklin Institute.]

SPECIFICATION OF A PATENT FOR A MODE OF FITTING THE BOXES FOR GUDGEONS INTO THE PLUMMER BLOCKS; AND ALSO THE FITTING OF THE BEARING OF THE SLIDES FOR LOCOMOTIVE AND OTHER STEAM ENGINES, AND FOR OTHER PURPOSES. GRANTED TO MATTHIAS W. BALDWIN, CITY OF PHILADELPHIA, AUGUST 17, 1835.

The boxes in which the gudgeons used about locomotive and other steam engines, and machinery of various kinds, are received and turn, have heretofore been fitted into the plummer blocks, or pedestals, made to receive them, by filing, or other analogous means, their ends being made either square or angular, and adapted to corresponding parts in the plummer block, or pedestal, prepared to receive them. My improved

mode of fitting them consists in turning or boring the opening, or seat in the plummer block, into which the boxes are to be fitted, so as to make each of the cheeks cylindrical segments. The boxes in which the gudgeon is to run, are then to be attached to each other by screws, or otherwise, and turned by means of a slide rest, or worked in any other manner, so as to make their ends cylindrical, and to cause them to fit exactly to the cylindrical cheeks, prepared for their reception, in the plummer block.

In constructing the slides for the pistons of locomotive and other steam engines, and for other purposes, the slide bar has usually been made square, or four sided, and its angles usually right angles; and the brasses, or bearings, contained in the box within which it slides, have been adjusted to it by set screws operating upon three sides thereof. In my improved mode of construction, the adjustment is made to operate upon two sides, or edges, only. For this purpose, I make my slide bar flat on two sides, and the other two sides, or edges, half round, or otherwise form them into two planes, meeting each other along the middle thereof, by which means the rod will become six sided, this latter form being preferred to the rounding of the edges. The box within which the bar slides, is provided with two brasses, or bearing pieces, with hollows, or grooves, in them, adapted to the edges of the sliding bar, and fitting accurately between the parallel sides of the box; when, therefore, the brasses, or bearings, are adjusted to the edges of the rod by set screws acting against them, the rod is embraced by them so as effectually to check all tendency to a lateral motion, as will appear by an inspection of the drawings deposited in the Patent Office.



Figs. 1 and 2, cross sections of the box and slide bar, with angular and with circular fittings.

A, slide bar.

B, brasses, or bearings.

C, boxes.

D, adjusting screws.

Fig. 3, horizontal section of a plummer block and boxes, through the centre of the gudgeons.

E, gudgeon.

F, box.

G, cheeks of the plummer block.

What I claim as my invention, and wish to secure by letters patent, is the mode of fitting the boxes of gudgeons into plummer blocks, pedestals, or other receptacles, by boring, turning, or otherwise, so as to make the fittings cylindrical. I also claim the fitting of the slides for the pistons of locomotive engines, for other purposes, into brasses, or boxes, adjusted and operating in the manner hereinbefore set forth.

MATTHIAS W. BALDWIN.

PREVENTIVE AGAINST DRY ROT.

We have been favored by an intelligent ship master with the following communication relating to recent successful experiments in England in the means of preserving ship timber against premature decay, which cannot fail to be of practical interest and value to many of our readers.—[New-Bedford Mercury.]

Mr. Lindsey:—If you think the following description of the method of preserving timber from rot, insects and worms, now universally adopted in England, is of importance to the public, you will confer a favor by giving it an insertion.

The writer of this is personally acquainted with the ingenious inventor—has attended the lectures in London on the subject, and is satisfied of the efficacy of his plan.

The material employed by the inventor is Corrosive Sublimate, long known as a great preservative of animal substances from decay. The timber to be prepared must be placed in a tank or vessel, from 40 to 80 feet long, 4 or 5 feet deep, and about the same width. A solution of the corrosive sublimate is then thrown upon it until covered; the proportion, according to the inventor, is 1 lb. of corrosive sublimate to 5 gallons of water—but individuals who have tried it, say 1 lb. to 10 gallons of water. Pine plank are saturated in 48 hours. An oak stick, 40 feet long and 1 foot square, requires three weeks—during which time it becomes effectually seasoned, and will not contract or shrink even on exposure to the highest temperature of a tropical climate. The corrosive sublimate has a strong affinity for the albumen or vegetable juices generally called sap, combines instantaneously with it, and forms a new chemical compound which is solid, insoluble, and will not attract moisture. The efficacy of this invention has been tested in the most extraordinary manner. Pieces of the timber prepared with a solution of the sublimate, and unprepared pieces, the latter well seasoned, were placed in the "*Rotten Pit*," at the King's Dock Yard, Woolwich, in 1828. In 1831, the writer of this was present when they were withdrawn. The prepared timber was perfectly sound—the unprepared, although of the best English oak, was a mass of rot and decayed vegetable matter. The prepared sticks were left on the ground in the open air six months, and then again placed in the Rotten Pit, with other pieces of well seasoned timber. At the end of two years the prepared timber was found quite sound—the seasoned very rotten.

The Rotten Pit, at Woolwich Yard, is a cave under ground, 80 feet long by 20 feet, and built by order of government, for the purpose of testing the efficacy of the various proposed nostrums for preserving timber. The pit is lined, top, bottom and sides, with vegetable matter in the worst possible stage of corruption—very damp and full of carbonic acid gas—it is a perfect hot-bed—a candle will not burn in it a minute, so foul is the air of this subterraneous chamber. In fact, no timber, although thoroughly salted, docked, or seasoned, will resist three months the powerful decomposing qualities of the Rotten Pit. The specimens were placed on the bottom of the pit, and half buried in the putrid vegetable matter with which the cave is kept supplied. This experiment seemed so conclusive, that Government immediately paid the inventor £10,000, and advised him to take out a patent. He was ordered to construct tanks at all the Dock Yards, and the government timber was immediately prepared in the above manner. Previous to this, individuals had fitted tanks, and two whalemen were built entirely of timber and plank prepared with the solution. House builders are also using it very generally in London. The sleepers, or foundations for railways—staves for oil casks, canvass, rope, and all vegetable matter, may be preserved by its use. It is found that a cubic foot of oak, will absorb three pints of the liquid, which will cost at the present price of quicksilver, $7\frac{1}{2}$ cents per cubic foot. A mere trifle compared with the immense advantage of having a material not liable to be destroyed by rot, worms, or insects of any kind. The objection urged against this material, is its poisonous nature. But it has been proved by careful experiment, that corrosive sublimate, when it combines with the sap of wood, forms a compound perfectly insoluble, and quite innocent—in fact, a complete chemical change takes place in the poisonous nature of the mixture by this combination.

The writer has seen experiments tried upon canvass and rope, which was immersed in the solution, and placed four months in a dunghill—the unprepared pieces were destroyed—while the texture of the prepared specimens was not weakened in the slightest degree—any one can try this by using the above proportions.

Satisfactory accounts have been received by Messrs. B. Rotch and M. Enderby, of London, from the captains of the whale ships constructed at their instance, of timber prepared as above—testifying that the crew were remarkably healthy, although they slept actually in contact with the ceiling plank thus prepared, through all climates and changes of temperature.

It is well known to practical men that salt is not an effectual preservative—as many ships salted on the stocks, have been found rotten the first voyage—one instance, the Enterprise of Nantucket. The Golconda, of New-Bedford, has had a new windlass three voyages in succession, and the lower masts of ships very quickly decay. These parts of a ship it is impossible to salt. In the British navy, the use of salt has been discontinued, as it is found to corrode the iron rapidly, and it also keeps a ship in a very damp state.

From Genesee Farmer.

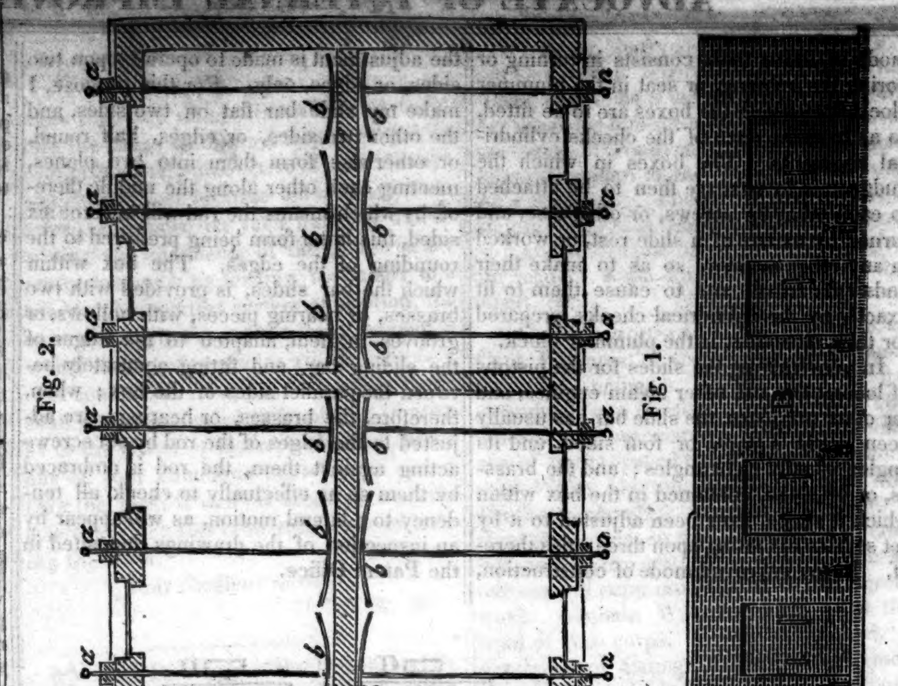
BEST VARIETIES OF THE SWEET APPLE.

BY HAMBURG.

Mr. Tucker—I noticed an article in the Monthly Genesee Farmer on the various uses and valuable properties of the sweet apple for fattening hogs, cattle, &c. I am impressed fully with the belief, that sweet apples for fattening hogs and cattle, are, when compared with the expense of cultivation, invaluable, though my experiments are quite limited as to the practical results. But the object of this communication is, to make some suggestions as it regards varieties, together with the seasons of ripening. It is remarked, I think, justly, that the early sweet Bough is worthy of particular attention, as being an excellent sweet apple, and as far as my knowledge extends, quite the best of the early varieties. There are two kinds of this Bough: the smaller kind is raised and much preferred in the county of Dutchess as being much the richest and most valuable, and quite as early—both excellent eating apples. The latter kind I have never seen in the western counties. The early Leicester Sweeting is also an apple of equal value, but about two weeks later. This is an excellent bearer, and will keep well to October. The Pound Sweeting comes along now, and is a good and profitable apple—also the Cabashire Sweeting, which is both large and fine. Then the Wing Sweeting, Tift Sweeting, Jersey Sweeting—also the Crow Egg. The Wing and Tift Sweetings are remarkably sweet, of a middling size, and very delicious for eating—also excellent bearers. Another remarkable quality is, they are fine for eating in October, and if they are put up with care, they are equally as good in the months of April and May, after being kept over the winter. They are fine through the winter for store hogs. The length of their season, the richness of their flavor, and the crops yearly produced by each tree, render them worthy the particular attention of every farmer. The Jersey Sweet is no less worthy of culture as it regards its qualities. In its richness and deliciousness for eating, &c., it is not surpassed by any other sweet apple in the State. There are a few kinds which I find among the selections made by persons grafting about the country that exceptions might be taken to, among which I will mention the pumpkin Sweeting, Golden Sweeting, &c. I am well acquainted with these fruits, and in my humble judgment they are not worth cultivating. In the first place they are a very coarse apple and quite liable to be watery at the core, and they will not keep any length of time; and further, there are others to be obtained that, to say the least, are much more valuable. One remark respecting grafting: I discover, from a number of years' observation, that the best time for grafting is as early as the weather in March will admit of their being set the best, as those early set generally grow much more thriftily and much larger the first year than those set late.

Respectfully, &c.

Hamburg.



Applications of Chemistry to the Useful Arts, being the substance of a Course of Lectures delivered in Columbia College, New-York, by James Renwick, Professor of Natural Experimental Philosophy and Chemistry.

IV.

APPLICATIONS OF CHLORINE.

Chlorine may be applied in its gaseous form, as obtained in the mode practised in laboratories by action of manganese (*peroxide of manganese*) upon muriatic acid; or by the action of sulphuric acid on common salt and manganese; or as evolved from the chloride of lime. It may also be applied in solution, prepared by passing the gas through water, by steeping chloride of lime in water, or in the form of the liquor of Labaraque (*chloride of soda.*) The use of chloride of lime in both cases, and of chloride of soda in the second, have superseded the other methods. In consequence, before explaining the uses of chlorine it is proper that the manufacture of these two preparations should be understood.

MANUFACTURE OF CHLORIDE OF LIME.

Authority.—Dumas. Chimie appliquee aux arts.

Chloride of lime in a dry form is manufactured in an apparatus invented by an English chemist, from whom the article is often called Tennant's bleaching powder. It consists of a retort or still of lead, connected by a pipe with a brick chamber cemented by a lute, which is not acted upon by chlorine. The still is heated by steam introduced into an envelope or *jacket* of cast iron. In the top of the still are two openings: one furnished with a stopper by which it is charged with manganese; to the other a bent tube is applied for the introduction of the acid, a part of which remaining in the tube serves as a valve to confine the gas. Within the still there is a reticulated vessel of cast iron, which is attached

to a rod passing through the top of the still. By means of this the materials are continually stirred in, order to bring new surfaces into contact. The still is so large as to receive a charge of 200 lbs. of manganese, and four are usually employed at once, for which reason the brick chamber is divided into four compartments.

The floor of the chamber is covered to the depth of three or four inches, with powdered lime, prepared by slaking. In some manufactories the hydrate of lime is disposed in wooden trays resting upon shelves within the chamber. Only half of these are filled at first. At the expiration of two days, the process is stopped, the chamber ventilated, and the remainder of the trays are introduced, being placed on the alternate shelves. The gas being again admitted, the process goes on for two days more, when the first set of trays are removed and replaced by others charged with fresh hydrate of lime. In this way the chamber always contains a portion of lime nearly saturated, and another portion nearly free of chlorine, and thus the decreasing rate at which hydrate of lime absorbs chlorine is compensated.

A still better mode, which is employed in a few instances, would be to keep the lime in a state of agitation. This has been objected to on account of the expense of the moving power, but in an establishment furnished with a steam engine, this would be of little importance.

The apparatus most generally used will be understood by reference to the annexed plate.

Fig. 1, elevation of the apparatus.
- A, leaden still.
- B, chamber in which the hydrate of lime is placed.

Fig. 2, section of still on a larger scale.
- *a*, opening by which the manganese is introdoced.
- *b*, funnel and bent tube for the introduction of the acid.
- *cc*, water valve by which the head of the still is adapted.
- *ee*, apparatus of cast iron for stirring the materials.

Fig. 3, plan of the chamber in which the hydrate of lime is placed.
- *aa*, iron rods which move the scrapers *bb*.

In some manufactories on a small scale, the hydrate of lime is placed in conical vessels of stone ware, having a hole near the bottom, to which the pipe that conveys the gas from the retort is luted. At the end of the process, the vessel is inverted, and the lime falls out. That which is not charged with chlorine remains in powder, and is therefore readily separated from that which is converted into chloride, which is adhesive.

The direct mode of obtaining chlorine, is by the action of peroxide of manganese on muriatic acid. This may, and is often, followed in the manufacture on a large scale. The equivalents of the substances which are employed in the laboratory, are, 1 of peroxide of manganese to 4 of hydrochloric (muriatic) acid. The results are 2 of chlorine, 2 of water, and 1 of protochloride of manganese. The proportions are approached on the large scale by 6¼ lbs. of pure oxide of magnanese, or a proportionate quantity of the common manganese of commerce, and 40 lbs. of common muriatic acid. The result should be about two cubic yards of the gas, weighing nearly ten pounds, and capable of saturating nearly fifteen pounds of hydrate of lime.

It is, however, obvious that a part of the chlorine has been lost by entering into combination with metallic manganese, and remaining in solution in water. A better process is therefore proposed by Dumas, by which an equal quantity of chlorine may be obtained at a far less expense of acid from a given quantity of common manganese. His formula is 10 or 12 lbs. of common manganese, equivalent to 6 1-2 of the peroxide, 4 lbs. of sulphuric acid, 4 lbs. of water, and 20 lbs. of muriatic acid. The retort being first charged with the manganese, the water is introduced, then the sulphuric, and finally the muriatic acid. The mixture of the water and sulphuric acid produce sufficient heat to cause the separation of the chlorine. No more fuel, therefore, need be used than is sufficient to keep up this temperature. In addition, the mixture is less likely to rise in viscid bubbles, and the chlorine is more free from water, as the attraction of the sulphuric acid will prevent that liquid from boiling until all the chlorine is disengaged. Sulphate of manganese will remain in solution instead of the chloride.

In some cases, however, the chloride of manganese may be of value, as it is used in dyeing. Here of course the existing process is to be preferred. When the manufacture of artificial soda is not a profitable object of industry, muriatic acid may be too expensive for the manufacture of chloride of lime. In this case, the materials whence that acid is obtainod (sulphuric acid and common salt,) may be used in its stead. The proportions in which they may be employed are, to 10 or 12 lbs. of common manganese, 12 of common salt, 20 of sulphuric acid, diluted with an equal quantity of water. The residuum of the retort is a solution of the sulphates of soda and of the protoxide of manganese.

A liquid mixture of lime and water (milk of lime) will condense 60 per cent. more chlorine than the dry hydrate. This preparation is not readily portable, but when the consumer manufactures it for himself, might be employed to great advantage. To make this liquid chloride, the milk of lime has been placed in a cylindric vessel of stone ware, lying horizontally, through the ends of which an axle is passed that carries a set of arms like those of a barrel-churn. The use of these is to agitate the mixture, and thus bring fresh surfaces of chlorine in contact with the chlorine.

From what has been stated above, it would appear that hydrate of lime is capable of condensing about two thirds of its weight of chlorine. In the ordinary manufacture, this strength is rarely reached, and the article may also be injured by exposure. It is therefore important that some mode should be pointed out by which the actual quantity of chlorine condensed by the lime should be ascertained. No ready method fitted for the use of practical men has yet been proposed, by which this object can be effected with certainty. The method in common use is rather relative than absolute, and consists in inquiring into the quantity of the solution of indigo in sulphuric acid, the solution of a given quantity of chloride of lime is capable of discoloring. This method will give different results, both from the different qualities of indigo and different modes of manipulation. But by using the same solution of indigo, and operating in exactly the same manner, the comparative value in reference to a standard parcel of chlorine of lime is capable of being ascertained with tolerable accuracy.

PREPARATION OF THE SOLUTION OF CHLORIDE OF SODA OR LIQUOR OF LABARAQUE.

The works on elementary chemistry give the mode proposed by Labaraque himself, for forming this liquor, by passing chlorine in its gaseous form through a solution of sub-carbonate of soda. It is therefore unnecessary to repeat it here. It may, however, be stated that the value of the liquor is not increased by saturating the water with chlorine, but that it is in its best state when the chlorine is condensed in the largest quantity which can exist without causing the escape of the carbonic acid; and it is usually inferred that the chlorine, decomposing a part of the sub-carbonate, causes its acid to unite with the remaining soda to form the neutral carbonate of soda. If the quantity of chlorine exceed this proportion, which is of course just half of what might be condensed, muriatic acid will form in the solution, and chloride of sodium will be the final result.

The most convenient process for the preparation of chloride of soda on the large scale, is that invented by Payen, in which the chloride of lime is decomposed by sub-carbonate of soda. The proportions in his formula are: 100 parts chloride of lime, 188 of crystalized sub-carbonate of soda, and 1800 of water. The chloride of lime being dissolved, and the solid residuum washed, the sub-carbonate of soda dissolved in boiling water is added; the liquor is filtered, and to the clear liquor 62 parts of crystalized sub-carbonate of soda is added.

1. DISINFECTING.

Rationale.—Chlorine owes its powers of destroying the offensive effluvia of putrescent animal and vegetable substances, and of rendering innocuous the matters which convey the contagion of infectious diseases, to its powerful affinity for hydrogen. The gases which arise from putrescent animal matter are principally ammonia (a hydroguret of nitrogen) and carburets of hydrogen; and although they are not the substances which affect our nerves most offensively, they are certainly the vehicles which convey those which do so to our organs of smell. The effluvia of decaying vegetables are principally composed of carburetted hydrogen, and although our senses cannot detect any other substance, yet there can be no question that the gas so produced does convey a matter injurious to the human constitution, for while the gas

manufactured for illumination may be breathed, even in quantities sufficient to render the air highly offensive, without injury, the same gas evolved from marshes and stagnant waters is always unwholsome. The diseased animal matter which composes the virus of cutaneous diseases, such as small pox, and collects in the sores of the plague, is also composed partly of hydrogen, and therefore capable of decomposition by chlorine. These peccant substances being capable of forming vapor, may thus be conveyed through the air, but in this state also, chlorine will act upon them.

Chlorine is destructive of animal life, and even when largely diluted immediately kills small animals. Even then, if, as some have supposed, the malaria which causes yellow fever and other analogous diseases of less malignancy, is owing to the presence of animalculæ, chlorine may be applied to destroy them.

Application.—Chlorine may be applied in its gaseous form to the disinfection of the air. The gas may be prepared as it is needed, by the action of peroxide of manganese (common manganese of the shops) on muriatic acid. This action, however, need not be aided by heat, as when the gas is prepared for chemical experiments, inasmuch as the object is to produce a constant and steady current, instead of a sudden and copious supply. A bottle, furnished with a glass plate ground to lie upon its neck, is well suited for this purpose, and may be made of various sizes, according to circumstances, there being a form so small and so conveniently arranged, that it may be carried in the pocket.

Chloride of lime may be decomposed, by the action of water. In order to obtain the gas, a portion of chloride of lime is put into a shallow basin and covered with water. As the evolution of the gas becomes feeble it may be rendered more rapid by adding a small quantity of acid. Sulphuric acid very much diluted may be employed, but it is better, particularly when it is used in families, to add common vinegar.

In disinfecting chambers and buildings, the doors and windows are to be closed, and the fumigation continued until the peculiar smell of chlorine can be perceived in every part, and remains permanently when its source is removed. In a sick room it will be expedient to continue the fumigation as long as the sick person remains in it, and for some hours after. All moist offensive matters should be sprinkled with the dry chloride, and dry matters covered with its solution.

A solution of chlorine may be prepared by steeping chloride of lime in water in the proportion of eight ounces to each gallon of water, and decanting it from the lime. This may be used for steeping the bedding and clothes of persons affected with contagious diseases, or to wet cloths in which putrescent matters may be wrapped; but the chloride of soda is a much more convenient and cleanly preparation. By the aid of it, human bodies far gone in putrefaction have been disinterred for examination; and by one or the other preparation, the disagreeable and often dangerous effects of animal and vegetable decomposition may be in a great measure prevented.

In cases where it may be necessary to touch persons affected with contagious diseases, the hands should be washed with one of the solutions, and this will be efficacious even after many minutes, unless the virulent matter have been introduced through a wound. By the use of these substances several diseases that have hitherto been scourges of the human race, have already been diminished in extent, and might, if all were prudent enough to employ them, be extinguished altogether.

To show their important value, a French physician in the Levant (Parisot) was able to inspire five other persons with confidence in the efficiency of chlorine; these were of varions ages and different constitutions. Six suits in which persons had died of the plague were purchased, steeped in solution of chloride of soda, and dried. Each person being furnished with a suit, wore it for several days. No one of the six took the disease, while, had there been no precaution, all former experience would have made it nearly certain that more than two thirds of them must have been infected, and a considerable proportion of these would have died.

In our own naval service, the only vessel in which yellow fever has occurred in the Gulf of Mexico, since fumigations with chlorine have been practised, was one where they were not employed; and in one of the Spanish expeditions against Mexico, several vessels loaded with soldiers and sailors, were exposed for months to the pestilential air of the Terras Callientes without a single case of fever occurring.

In fine, we cannot avoid expressing our conviction that it is impossible, that any disease truly contagious can be propagated in air so charged with chlorine that its peculiar smell is sensible, nor any malady arising from the presence of unwholsome vegetable and animal matter. It will of course be impossible to disinfect extensive districts by artificial means, but so long as a disorder is confined to a limited space, its further extension may be checked, and even a building in an infected district may be rendered safe to its inhabitants, provided they do not quit its walls, by the aid of chlorine.

Experiments seem to be wanting, whence we might judge whether chlorine is as efficient in checking the extension of cholera, as it certainly is in preventing the spreading of other diseases; the impression of medical men, however, is that it is not.

2. BLEACHING.

History.—The ancient progress of bleaching vegetable matters is the same as that employed for domestic purposes, with the addition of an agent to neutralize alkaline matter which might otherwise injure the vegetable fibre. The articles were repeatedly washed with alkaline leys, or with soap; they were then steeped in a weak acid; and, after being well rinsed in pure water, were spread out on meadows in order to be exposed to the sun and air. In this position they were frequently sprinkled with water. The only water which is adapted to this purpose is that which in ordinary language is called soft. This is found in streams only at a distance from their source, and from a command of water of this description, as well as from the extent of its meadow lands, Holland for a long time monopolized the bleaching of the greater part of Europe. The linens of Ireland and Great Britain were sent thither to be bleached, and, as the process was a long one, it was seldom that the capital employed in the manufacture was turned more than once a year. The successive washing, and exposures to the air requiring to be repeated fourteen or fifteen times, and the latter being only practicable in fine weather. The acid used to neutralize the alkaline matter was sour milk, in which by fermentation acetic acid had been generated.

The first improvement in the process was the substitution of dilute sulphuric acid for the sour milk. Still, there was no great saving in time, until Berthollet in France proposed the application of the bleaching properties of chlorine. This substance was at first applied in its gaseous form to the articles, suspended while wet with water in close chambers. Its solution in water was next introduced. This has the defects of being difficult of carriage, and of becoming charged with muriatic acid by the decomposition of the water. In order to neutralize the acid as it forms, the water, was charged with a carbonated alkali or with magnesian earth. In the use of the former it was discovered that a chloride of the alkali was formed which would be decomposed by the coloring matter of the vegetable substance, and that in this liquid chloride, more of the chlorine was retained than in the same bulk of pure water. This liquid chloride of Potassa has been much used under the name of liquor of Javelle.

The use of magnesia led to the discovery of the dry chloride of that earth, and it being found that a similar compound was formed with lime, the latter in consequence of its inferior cost finally superseded the former. By the use of chlorine in either mode, the process which formerly occupied several months, is now completed in a day or two.

Rationale.—Hemp, Flax, and Cotton, which are the only substances of vegetable origin that are much employed in the manufacture of cloths, are more or less colored with a brown or yellowish substance. This coloring matter is partly oleaginous, and partly resinous. The oleaginous matter is rendered soluble in water by an alkali; but as any excess of this would attack the vegetable fibre, it must be neutralized by an acid. The resinous part of the coloring matter, if moist, decomposes slowly on exposure to the sun and air; hence the ancient mode of bleaching. This resinous matter when no longer protected by the oil is rapidly decomposed by chlorine; hence the modern method.

(A) BLEACHING OF COTTON YARN BY CHLORINE.

AUTHORITY—VITALIS, Cours de Teinture.

First operation.—Alkaline Bath.—A quantity of good pearlash in powder is mixed with half its weight of recently slacked lime. To this is added water in the proportion of thirty times the weight of the

potash. The mixture is occasionally stirred, and at the end of twenty-four hours is allowed to settle. The clear liquor is then decanted. The yarn to be bleached is thrown loosely into a copper boiler, and the alkaline solution poured upon it, until the upper part of the cotton is two or three inches beneath the surface of the liquid. The boiler is then slowly heated until the liquor boils, and the ebullition is kept up for four hours. At the end of this time the cotton is removed, and after being permitted to drain, is well rinsed in running water, after which the liquid is wrung out, and the yarn hung up to dry; in fine weather in the open air, and in bad weather under sheds.

Second operation.—Bath of Chlorine.—This bath is formed by steeping chloride of lime in water, in the proportion of eight ounces to each gallon; the insoluble matter is allowed to settle, and the liquor decanted. The yarn is placed in regular layers in a wooden vat, the hanks in the successive layers crossing each other. On these the clear solution of chloride of lime is poured until they are completely immersed, and the liquor rises above them three or four inches. The yarn having been steeped for a couple of hours, the liquid is drawn off by a spigot in the bottom of the vat, and is replaced by pure water, which being drawn off in its turn, carries with it the chloride which may have adhered to the yarn. The yarn is then rinsed in running water, wrung and hung out to dry.

Third operation.—Acid Bath.—Sulphuric acid is diluted with sixty times its weight of water, and the yarn is steeped in it for a time not exceeding a single hour for the coarsest numbers and less for the finer yarn. On taking it from this bath. it must be repeatedly washed with great care in running water.

Fourth operation.—Soap Bath.—The yarn is washed with white soap in water for the purposes of neutralizing any sulphuric acid which may remain, of removing the last portions of chlorine, and of rendering the cotton soft and flexible. It is then rinsed, wrung, and dried.

In order to brighten the color, cotton is sometimes steeped after the four preceding operations in water, through which a small quantity of cobalt blue has been disseminated.

These operations are sufficient for the inferior qualities of cotton yarn. The finer kinds are immersed in an alkaline bath of greater strength; are twice passed through a bath of chloride of lime, that used the second time being weaker than the first; and cobalt blue is always employed to finish them.

Linen and hemp threads are bleached in the same manner as cotton yarn, but they must be prepared for the alkaline bath by steeping them for two or three days in water, by which the coloring matter is softened and made more accessible to the chemical agents. The methods for bleaching woven cloths of the three several materials are more difficult than are necessary for yarn, but do not differ in principle. It is only necessary, according to the firmness of the cloth, to repeat the processes in regular succession two or three times.

It may be remarked that bleaching by chlorine, if carefully performed, is, contrary to general prejudice, less likely to injure the texture of the material than grass bleaching. The latter, too, may be said to be wholly abandoned, so that the inscription upon foreign goods of "genuine grass bleach," is untrue, and were it true, would be no warrant of superiority in quality.

Chlorine does not act upon the native coloring matters of wool or silk, but as the modes for discharging them go under the same name, we may with propriety consider them in this place.

(B) BLEACHING OF SILK.

AUTHORITY.—VITALIS. Art de Teinture.

Silk is covered with a substance which has the character of a gum, and is usually of a color more or less inclining to yellow, although the finer raw silks of China are said to be perfectly white. Even in the latter case, the process which is used to discharge the color, is in some degree necessary to prepare the silk for receiving dyes.

Silk may be bleached either by the aid of sulphurous acid or without it.

To bleach it without the use of sulphurous acid, a bath is prepared by dissolving white soap in water, in the proportion of 30 parts to 100 of silk. The solution is raised to the boiling temperature, but not permitted to undergo the act of ebullition. The silk is steeped in this bath until the harshness given by the gum disappears, and is then wrung out and dried. It is next put into sacks made of coarse canvass, each of which holds about thirty pounds of silk. These sacks are put into a boiler with a weaker solution of white soap, which is boiled for an hour and a half. The silk is then taken out, rinsed in running water, and dried. The dry silk is finally steeped in a bath of hot but not boiling water, in which white soap in the proportion of a pound to 30 gallons of water has been dissolved. To this is added a small quantity of some coloring matter, which is anatto when the hue of Chinese silk is to be imitated, and cobalt blue in other cases.

This method is less perfect than that which brings in the aid of sulphurous acid, as a substitute for the last of the three baths above described. The silk, after being rinsed from the second bath of soap is suspended upon poles about 8 feet above the floor of a chamber, which has no chimney, and is provided with doors and window-shutters that can be opened and closed without entering the chamber. For every hundred pounds of silk a pound and a half of roll-brimstone is put into an earthen dish on the floor of the chamber, and set on fire. The doors and windows are then tightly closed. The sulphurous acid which is first generated by the combustion of the sulphur is condensed by the water adhering to the silk, and after this is saturated, fills the chamber. The silk is left in this atmosphere of sulphurous acid for twenty four hours, after which the doors and windows are opened and the chamber ventillated. In summer the current of air which replaces the sulphurous acid is sufficient to dry the silk. In winter portable furnaces containing charcoal in small fragments are introducee into the chamber, and after they are set on fire the doors and windows are closed. In both cases, the combustion, whether of sulphur or charcoal is slow, as the necessary oxygen must make its way through the accidental crevices of the doors and windows.

In neither of the ways above described is the discoloration of the silk permanent. On exposure to the air in wear, the natural color of the silk is partially restored. It therefore becomes necessary to bleach white silks that are in wear, from time to time. This is done by suspending them, while wet, in a barrel, in the bottom of which a small quantity of sulphur is inflamed in an earthen vessel. The top of the barrel is then covered by a cloth, and the whole is left undisturbed for several hours.

BLEACHING OF WOOL.

Wool is coated with a greasy substance called the *Yelk*, with which a yellow coloring matter is combined. The coarser wools contain least of this substance, but in the finer merinoes it amounts to two thirds of the whole weight. The removal of this cannot be wholly effected by chemical means, but must be partially effected by the mechanical operation called fulling. This may be performed upon the wool, on yarn, or on the woven cloth. It consist in beating the article in a mill, with water and a mineral called Fuller's Earth, which is a silicate of alumina in which the silex is in greater proportion than in ordinary clays.

After having been fulled, the wool is washed in luke warm water, in which a small quantity of a soap is dissolved, until the residue of the yelk is removed. After being allowed to drain, it is rinsed in running water, permitted again to drain, and dried in the air.

This method is not successful unless the water is perfectly free from saline matter, or in ordinary language soft. In districts where large supplies of soft water cannot be obtained, it is considered necessary to mix the water used in cleansing wool with one fourth of its bulk of putrid urine. This supplies an ammoniacal salt, (phosphate of ammonia and soda;) by which the sulphate of lime, which gives to water the character know by the epithet *hard* is decomposed. In countries where the woolen manufacture is carried on extensively, this disgusting substance is in consequence a profitable article of commerce. There are however modes of rendering water soft, which we shall have occasion to describe hereafter, which might be advantagously introduced in the woolen manufacture.

LABORERS WANTED.—Two thousand laborers, says the Philadelphia Price Current, will find constant employment upon the upper section of the Lehigh Canal and the Railroad connected with this work. The country is healthy, and the wages liberal.

The coal dealers on the Schuylkill also advertise for 500 laborers, at $1 per day, from 6 to 6, and 12 1-2 cents per hour for extra work.

THE UPPER LAKES.—The Troy and Erie Line have made arrangements to despatch a Steamboat from Buffalo for Chicago every ten days. The first Boat is advertised to start on the 25th instant.

AGRICULTURE, &c.

From the British Farmer's Magazine.

ON THE UTILITY OF CHEMISTRY TO AGRICULTURE AND HORTICULTURE.

By Mr. Towers, author of the "Domestic Gardener's Manual," C. M. H. S.

I do not affect to apologise for the introduction of this subject at some length, into your pages, because I conceive that, however it may have occupied the attention of practical farmers, upon the urgent recommendation of men and science, it has been misunderstood, and, therefore, unjustly agitated.

I have been induced to resume the consideration, by the perusal of those admirable papers in your two last numbers, entitled *Essay on Calcareous Manures*—by Mr. Ruffin—papers which, I think, contain the soundest truths, and, therefore, may be rendered more practically available than most of the elaborate works that have preceded them. The propositions of the writer require, however, to be impartially examined; but before I attempt to do so, I shall cite a passage from a chemical work, written by that worthy and zealous man, the late Mr. Samuel Parkes, whereby the reader may, at one view, appreciate the object of the chemist, and the weight of the arguments he employs, when he urges the necessity to call his science in aid of the agriculturist.

"Chemistry" (it is observed) "will teach him" (an opulent land-owner) "how to improve the *cultivated* parts of his estate; and by transporting and transposing the different soils, he will soon learn some method by which each of his fields may be rendered more productive.

"The analysis of soils will be followed by that of the waters which rise upon, or flow through them; by which means he will discover those proper for irrigation, a practice, the value of which is sufficiently known to every good agriculturist.

"Should he himself occupy the farm, and become cultivator of his own estate, he must, of necessity, be a chemist, before he can make the most of his land, or put it in a high state of cultivation, at the smallest possible expense. It will be his concern, not only to analyze the soils on the different parts of his farm, but the peat, the marl, the lime, and the other manures, must be subjected to experiment, before he can avail himself of the advantages which they possess, or before he can be certain of producing any particular effect by their means. The necessity of analysis to the farmer is evident from a knowledge of the circumstance, that some kind of lime" (*magnesian limestone*) "is really injurious, and would render land which had been hitherto very productive, actually steril."—(Chemical Essays, vol. i. pp. 8, 9,)—Again:

"A knowledge of the first principles of chemistry will teach him when to use lime *hot* from the kiln, and when *slacked*; how to promote the putrefactive process in his composts, and at what period to check it, so as to prevent the furtilizing particles becoming effete, and of little value.

"It will teach him the difference in the properties of marl, lime, peat, wood ashes, alkaline salt, soap waste, sea water, &c., and, consequently, which to prefer in all varieties of soil. A knowledge of the chemical properties of bodies will thus give a new character to the agriculturist, and render his employment rational and respectable."—(Idem., pp. 10, 11.) And in a note—

"Lavoisier cultivated 240 acres of land in La Vendee, on chemical principles, in order to set a good example to the farmers; and his mode of culture was attended with so much success, that he obtained a third more of crop than was procured by the usual method, and in nine years his annual produce was doubled.—[From Lalande's Life of Lavoisier.]

Thus far the pretensions of the chemist are made out; his objects are defined, and it must be admitted that with the exception of one or two points, which, not to be hypercritical, we may safely pass by, science has laid no claim that she cannot establish. Chemists *can* analyze soils, *can* determine the quality and quantity of their component parts, *can* detect acids if such exist, and point out antagonist principles by which they may be rendered neutral, and, to a certain extent, innoxious: thus far, then, the chemist and his science must be useful to the agriculturist; nothing but the most dense prejudice can oppose this admission; and were every farmer to become an analytic chemist, to the extent above referred to, and be able to detect the components of his soils and manures, his mind would be enlarged, his sources of rational pleasure and amusements increased, and his practice removed further from that of the empiric, in proportion as it became based upon philosophic truth.

In a former paper (No. xxxiv., p. 537,) I have endeavored to elucidate the science and operations of analysis: I now find a powerful condjutor in Mr. Ruffin; and am satisfied that, his remarks and observations under that head of his essay, entitled "*Results of the chemical examination of various soils*," and the process therein described, are some of the most luminous which I have ever met with. The prespicuity of his description clearly demonstrates that he was familiar with his subject, and the young agricultural chemist may safely follow his steps, and rely upon the general accuracy of his deductions.

Having thus upheld the cause of chemistry I must advert to those points wherein I consider it has less claim to confidence; and these may be shortly exhibited, so as not to burden the subject unnecessarily.

The operations of chemistry have a legitimate object when they are performed upon what is considered dead or inert matter; thus, there is no material substance throughout the range of created things, which, provided it be not endowed with the *vital principle*, may not justly be submitted to the test of chemical agents. It is now admitted by our best philosophers, that chemical action is entirely dependent upon, and identical with, electrical energy; that, in fact, the combination of all substances, and their decomposition, are maintained and effected by electrical affinities. As electricity, is the most influential of the great natural agents; being an immediate emanation (I use this word for want of a better term,) from the source of light, the sun, whose rays have been poured upon the world from the commencement of time; and as chemical action is but a manifestation of electric energy, it follows, that every individual thing which can be dissolved, decomposed, or in any way disturbed, so as to cause a change in the arrangement of its constituents, is imbued with the essence of light. Chemistry, therefore—to say the least of it—is one of the grandest and most comprehensive sciences which the human mind can employ in its researches after truth.

But the vital principle, though it may be, and probaby is, connected with electrical action, is not a legitimate subject of chemical experiment; and those chemists have erred who have attempted to discover its nature by chemical ageny. *That which destroys life*, or interferes with the vital functions, can neither tend to elucidate the nature of the one, nor discover the causes of the other. The principle of life, whether it be that of animals or of vegetables, appears to be directly antagonist to chemical energy; no one, therefore, can be justified in attempting to interpret any of the phenomena of vegetable life, by the application of chemical principles. Chemists, then, it appears to me, have weakened their own cause by endeavoring to prove too much: we know nothing of life, we consequently cannot interpret its phenomena, or refer them to those agencies which are called into action by its extinction.

Scientific men have also laid themselves open to reproof, or even reproach, by their speculative reasonings upon the practical operations of the farmer. In the laboratory the chemist moves in his own appropriate sphere; there he can, and ought to investigate the substances which nature has rendered the matrix of her vegetable productions; and thence, he may diffuse, in every direction, a knowledge of the facts which his genius and experimental acumen have enabled him to elicit; but he has no right to criticise the practice of the agriculturist in respect to the management of his crops. Abstract reasoning, from deductions drawn from the most refined experiments upon dead matter, can never authorize any interference with the well grounded practice of the cultivator—of an organized being endowed with the mysterious principle of life. Even in that modern and comprehensive doctrine of the *radical exudation by plants*, which bears directly upon the *rotation of crops*, and interprets its philosophy, the experiments which have detected exuded matters by the test of re-agents, ought to be regarded with suspicious caution, inasmuch as they have, one and all, been performed upon plants placed in unnatural situations, and acted upon by some medium altogether different from that of the soil, in which alone they could flourish, and perfectly develope their foliage and fruit.

It is the duty of the chemist to lay down clear and definite rules, by which soils and manures may be correctly analysed; and if, with an intimate knowledge of practical and theoretic science, he can combine a knowledge also of farming, attained by actual experience—as was in fact exemplified in the person by the renowned Lavoisier, and now by the writings of Mr. Ruffin—he is pre-eminently qualified to instruct, and to recommend his principles by the force of example. But in ordinary cases, men of the highest attainments in experimental science cannot command time, or the means to become extensive cultivators: hence it would always be wise to point out those facts which cannot be controverted, and to let the practical man avail himself of the aids thus furnished, in any way which his good sense may direct. If the farmer be so unconcerned or prejudiced, as to overlook or reject those important instruments of research which are offered to his notice, the blame must rest with himself. Farming is, at the present moment, in a state that demands all the resources which science can furnish. The prices of every product of the farm are reduced to a very alarming extent: but the reduction though great, bears no comparison with that of almost all the preparations of the manufacturing chemist. Yet the extension of his science has enabled him to bear up with a bold front against a depreciation of two, three, per-

haps four hundred per cent.; and now to produce, with a remunerating profit, chemicals of a quality far superior to those which his predecessors sold at an enormously high price. Farmers, therefore, while they feel and admit the necessity to adopt every economical measure to insure increased produce, ought to regard the chemist and his art with reverential deference. Even the simple perusal—by a man of discernment—of the "*Electrical Researches*" of the amiable and accomplished Faraday, is amply sufficient to prove, beyond a doubt, the scientific chemist to be a person of superior order; one to whom the revealment of the wonder-woking secrets of nature is intrusted; and his art, the grandest, the most sublime treasure that could be conferred on any created being. That science, legitimately directed, is well qualified to assist the farmer, and promote his welfare, for it bears directly upon the agents which he employs in the culture of every one of his crops.

One other objection to the general utility of chemistry to agriculture remains to be noticed before I pass to the investigation of Mr. Ruffin's propositions, namely:—it is asserted and freely admitted, that the nature of soils lies open to the investigations of the chemist; but it may too frequently occur, that although experiment can readily detect the components of a soil, point out an antidote for any deleterious substance which may be traced therein, and show that in which it may be deficient, the substance required, either to correct the evil or supply the deficiency, may not be at hand. Thus, a soil may superabound in sand, or exhibit a poisonous salt of iron; but alumen or pure lime may be unattainable, unless at an outlay which would neutralize the benefit to be derived from the use of either. Fortunately, however, science can go a considerable way towards procuring an artificial remedy, and thus tend to supply the deficiency of the natural one; but as I must recur to this subject hereafter, I shall not dwell upon it now.

It is somewhat unfortunate that the "*Essay on Calcareous Manures*" was written expressly for America. Mr. Ruffin, it is true, makes frequent allusions to the theories and experiments of British chemists; but his own observations and analyses apply purely to the soils of the United States—to that part at least of which he observes, "no chalk is to be found in our country, and it is only from European authors that we can know any thing of its agricultural characters, when nearly pure, or when forming a very large proportion of the surface of the land."

Mr. Ruffin's arrangement, however, of the three principal earth, is clear, precise, and correct; as is also his general conclusion at the end of the before mentioned page, viz. "the mixture of the three earths, in due proportions, will correct the deffects of all; and with a sufficiency of animal or vegetable matter, putrescent, and soluble in water, a soil is formed in which plants can extend their roots freely," &c. &c.

But he, perhaps, labors under an error in supposing that all the earths, when pure, "are entirely barren; or that *chalk*, alone, could give them the fertilizing principle." The only soil which I have ever met with, that has appeared to be wholly destitute of calcareous matter, (or, at least, that which affords no trace of it to the muriatic acid test,) is a black bog peat; but in this soil a few plants will gro v with extreme verdure. It does not appear to me that the absence of calcareous earth is the sole cause of the general sterility of turbary soils; I refer it to the situation in which they are originally produced, and in this point, a remark made by Mr. Hayward will apply very pertinently. In the paper on the *Food of Plants*, which precedes *the Essay*, and in the middle of the page 197, it is observed: "if a quantity of the leaves of trees be collected, and immersed in a cistern or pool of stagnant water, and permitted to remain undisturbed for three years, they will be decomposed, and in appearance will be in that state, which, placed on the surface of the earth, should form a fertilizing substance; yet it will be found so sterile that no plant will grow in it."

Now the true peat mosses are formed, in the large way, in a manner analogous to the earth of decayed, immersed leaves, above described; that is, a bulk of vegetable matter is burried, and becomes sodden under water. Now leaves, and, indeed, vegetable substances in general, if burnt, yield a great abundance of *carbonate of lime*, as indeed, Mr. Ruffin asserts; therefore, though it may be presumed that, while in a growing state, these substances contain no *chalk*, properly considered as such, yet the elements of that earth must exist in them, otherwise it could not be revealed by the action of fire. Inert vegetable soils then, may originate in the peculiar action of water upon them, while they are deposited in a situation from which atmospheric air is excluded. This, too, accords with Mr. Hayward's idea, and it appears to be well founded. One of the most energetic loams which I have ever tested, contains merely a hint of *conbonate of lime*; it is of a fine, ochrous color, a velvety, unctuous texture, and when washed by various effusions of water, yields nearly three fourths of its bulk of impalpable matters, the remainder being a moderately fine silicious sand. When muriatic acid is applied to the fine matters, it produces little effervescence, and detects scarcely two per cent. of chalk. This loam is applicable to almost every species of plants; far more so than many earths which contain three times the proportion of chalk named, with double the quantity of warm sand. But if calcareous matter be the principal meliorating medium, the quantity required must be small indeed, if that in the loam just alluded to be sufficient to establish the fertilizing principle.*

The first proposition of the Essay refers chiefly to the hypothesis that "soils naturally poor, cannot be permanently enriched;" and, "that the labors of man have been but of little avail in altering the characters and qualities given to soils by nature."

In as far as this view extends, I heartily assent to the opinion of the Essayist, and on the ground which I, for some time, have asumed—that, "soils, be their nature what it may, tend to reduce manuring substances to earths of their own precise quality;" and in accordance with this doctrine, I hold it highly probable that the ultimate end of manuring is to support and maintain the quality and bulk of the staple soil.

Earth may be gorged with manure, but it is not thereby enriched. Plants may be rendered richly luxuriant in a gorged soil, but their health and vigor are not thereby increased. A medium state of soil, wherein it contains a prper quantity of enriching decomposable matters, is most favourable to healthy and robust vegetation; and in if those matters soon disappear, and nothing but earth remains after a few crops have exerted their energies upon the soil. Any one who has witnessed the effects of sand upon a very liberal supply of manure, after a crop has been taken, will not be at a loss to determine what the terms "barren" and hungry, mean when applied to land. Strong loams, on the contrary, hold the manures unchanged for a considerable time when not cropped, and retain the active principle more tenaciously by far, than light sands, even when severely cropped. Now it is certain that every correct analysis has proved the convertibility of farm-yard manures into, not only the elements of vegetables, but also into the three staple earths themselves; if then, a hungry sand, after a liberal system of manuring for years, still return to its original state of poverty, what must have become of the *alumen*, the *carbonate of lime*, and the *oxide of iron*, which the manuring substances were capable of yielding under certain conditions, to say nothing of the oxygen, the hydrogen, the carbon, and the azote, all of which gaseous products, may be presumed to have been taken up by vegetable vital action.

Every fact that I am aware of, seems to prove—first, that vegetable action tends to decompose manuring substances within the soil: secondly, that these substances are either wholly consumed, or deposite a residuum which is percisely similar in character to that of the natural earth, leaving it, whether it be sandy, clayey, or loamy, neither more nor less rich than it was in its original constitution. If this view of the results of manuring be correct, then Mr. Ruffin's first proposition is so far, to all intents and purposes, established.

The second proposition of the Essay unfortunately refers almost exclusively to the soils of Virginia, but one point of it, which is of great interest, is contained in the following lines—"The abundance of *putrescent vegetable matter* might well be considered the cause of fertility, by one who judged only from lands long under cultivation."—"Vegetable matter abounds in all rich land, it is admitted; but it has also been furnished by nature, in quantities exceeding all computation, to the most barren soils we own." The author then proceeds to state, that calcareous earth—by which term he always intends to express *chalk, i. e. carbonate of lime*—is "the cause of fertility, and the cure for barrenness."

The arguments are well sustained throughout theremaining part of the Essay, and prove the value and importance of chemical knowledge: they are, however, far too extensive to permit of being minutely investigated; and, indeed, may not be generally applicable to the soils of England. However, it would be highly desirable that particular attention be given to the facts adduced, in all districts where peat mosses exist, or have been recently reclaimed, for therein vegetable remains abound; and

---

* Th soil, containing "scarcely two per cent. of chalk," is abundantly calcareous to have acquired, and to retain all its fertility, according to to the theory maintained in the Essay on Calcareous Manures. Any quantity, however minute, of CARBONATE of lime found ntaurally existing in a soil, proves that there had been enough for its use and benefit. The author of the Essay was far from maintaining that the proportion of CARBONATE of lime found in any soil, was the measure of its fertilty. The quantity originally given to soils, by natural causes, when not excessive, and under like circumstances, might have served to measure the power to acquire and fix fertility. But in the course of reaching that end, the lime is supposed by combining with vegetable acid, to cease to be the carbonate, and is no longer detected in that form. This soil which Mr. Towers scarcely considers calcareous—or as containing "merely a hint of carbonate of lime," is in fact better supplied with that ingredient than almost any natural soil in our Atlantic States—not even excepting our limestone soils. Indeed, the only soils more calcareous, are the few and very limited spots on which shells have been deposited.—Ed. Farm. Reg.

though these substances contain the elements of calcareous earth, they also are replete with those of vegetable acids, inasmuch as they are chiefly composed of oxygen, hydrogen and carbon—the bases of all such acids. The presence of acids need not therefore, be questioned, though they may not be traceable as such, being taken up and neutralized by the chalk, or alkalescent matters with which they come in contact as they are produced.

The sterility of pure peaty soils, and their incapability of improvement by manuring substances, tend much to strengthen the second proposition, as does the fact that paring and burning are found experimentaly, to be meliorating processes of great efficiency; and why? simply, because the agency of fire decomposes the vegetable matters, destroys the acidifying elements, or, to speak more correctly, disperses them in the form of gasses, or aqueous vapor, liberates and fixes the carbonate of lime, and a portion of free carbon, and perhaps, (generally) a little carbonate of potassa, also. Here, then, we perceive another proof of the importance of chemical science, for nothing else could ascertain the results of the combustion of the peat, or refer them to their proper causes.

Mr. Ruffin's observations prove the correctness and accuracy of his analysis and conclusions. *All wood ashes*, as I have proved by reiterated experiments, and asserted, do contain *carbonate of lime*, and some other neutral alkaline salts, but whether these saline compounds have been furnished "by soil on which the plants grew," as he supposes, is to me a matter of some doubt. The *roots* are the media which connect the plant with the earth, and the *leaves* expose it to the influence of light and air; of these facts there can be no doubt; but several experiments with the sap of a bleeding vine, have led me to hesitate on the subject of the components of that fluid. I have not been able, as yet, to detect the presence of carbonic acid in it, but future experiments may furnish more decisive evidence than any which have yet come under my observation; still however, I lean to the opinion that, it is by no means from the soil alone that plants derive their specific juices. When we perceive that *aerolites*, containing metalic compounds of a peculiar nature, are formed in the atmosphere; that masses of hundreds of pounds in weight are precipitated from the air to the earth—(admitting the records of these startling phenomena to be founded in fact)—we need scarcely doubt the possibility of the convertion of the elements of water alone into all the specific secretions of plants, through the agency of light and air.

But, be this as it may, the theory of the neutralization of the vegetable acids by the carbonate of lime, naturally existing in the soil, is at once bold, novel and extremely plausible. The whole tissue of arguments adduced, are very ingenious and philosophical; and though they do not apply with equal force to the soils of Britain, are highly important to the philosophical agriculturist.

Nothing can be more correct than the assumption that vegetable matters under fermentation, (which is a chemical change of the constituents of dead vegetable matter, effected by the play of electrical affinities,) produce acetic and carbonic acids, perhaps also the muriatic acid; and these would be taken up in their nascent state by any alkaline substance existing in the soil. Acetic acid would be carried off, were it not fixed by some chemical agent; but if met with lime or potass, a neutral soluble compound would be formed; such, to an extreme degree, is the acetate of potass, a salt so greedy of water, that it liquifies if it be exposed only for a few minutes to the action of the atmosphere.

Leaves, and most vegetable bodies, affords manifest proofs of the presence of salts, particularly of salts of lime; not that they contain any chalk in its pure state, but they, in many instances, yield it to the mineral acids by mere digestion in them, without having undergone combustion. Thus, while we attest the truth of the chemical law adduced by Mr. Ruffin—that if any combination of lime with a vegetable acid "had been taken up into the sap vessels of a tree, it would be decomposed by the heat necessary to convert the wood to ashes; the acid would be reduced to its elementary principles, and the lime would immediately unite with the carbonic acid," produced by the process of combustion; we feel assured, by the evidence of facts, that mineral acids may attract from *green* vegetable substances the calcareous matters which lie masked among the cells of the plant, in a state of union with some unsuspected acid. I have thus detected, or rather produced, carbonate of lime, by digesting some sorts of moss in a weak cold solution of muriatic acid. I have also found a considerable portion in the leaves of a pine apple, but not to equal that which was yielded after combustion.

The combustion of vegetable remains, as leaves, haulm, sticks, and all such refuse, offers the ready means to furnish calcareous matters and alkali to land that is deficient of those important substances, in cases where it may not be easy to procure them in bulk. Many have objected to the process of burning, styling it a wasteful expenditure of manure; and so it may be considered if a soil be ill supplied with decomposable matters; but it is self-evident that, if a farm-yard manure be abundant, and the land of a light friable nature, void of chalk; or, on the other hand, if it be clayey and too adhesive, the products of combustion must offer meliorating substances of first rate quality.

I cannot now dwell upon Mr. Ruffin's observations concerning the original constitution of what he terms *neutral soils*, or notice the changes they may have undergone; these considerations, and others which refer to his remaining propositions, must be, for the present, deferred.

I regard his essay as a master piece; he has therein practically demonstrated the importance and vast utility of chemistry. His knowledge of refined processes may, perhaps, as he leads us to infer, be somewhat limited; but he has shown that he knows enough to analyse correctly, to describe accurately, and to apply the principles of chemistry with the best effect.

I trust we shall soon be favored with the remaining parts of his essay, for science owes him much, and its friends cannot but be delighted with the aid she has received at his hands. A few more such papers, widely disseminated through the most influential channels, could scarcely fail to convince the most sceptical, that he who could thus apply to the operations of husbandry the scientific principles which he has acquired, must be, in every way, qualified to make the most of his land, be its quality what it may; and thus to increase his profits while he improves his practice of agriculture, and calls into action the utmost productive power of his farm by a liberal, but wisely directed system of tillage,

G. I. T.

October 21st, 1835.

From the Genesee Farmer.

LETTERS FROM A FATHER, LIVING IN THE STATE OF NEW-YORK, TO HIS SON IN WESTERN PENNSYLVANIA, ON THE ADVANTAGES OF KEEPING LIVE STOCK, THE IMPORTANCE OF HAVING GOOD BREEDS, ETC.

Having taken a cursory view of the principal crops cultivated in the country, and having noticed the quality of soil and manner of culture adapted to each, and in some instances their comparative value, I am now ready to take my leave, as to these letters, of this department of husbandry. I take my leave of it accordingly, and bid it farewell.

There is another department of rural husbandry which, if I am not mistaken, offers to you, and your fellow citizens, peculiar inducements to become interested in it. I allude now to the breeding and rearing of domestic animals, and the various uses in which they are susceptible of being rendered serviceable to man. It does not appear to me that your farm, or any other in your immediate neighborhood, is so well adapted to the growth of grain as to the several uses of grazing. Nor is it, in my view, likely that Western Pennsylvania, in general, will ever be distinguished as a grain growing, and especially as a wheat growing country. For other attributes, not less desirable and important, it may be, and probably will be, highly distinguished. Who that has witnessed the fine pastures of white clover that are to be seen there in all directions, can doubt that the country is admirably adapted to grazing purposes? The inhabitants of that country should listen to the voice of nature, and yield prompt obedience to the lessons which she teaches. What says nature? What is the language which she speaks, in exhibiting those fine pastures? Most certainly it is, bring hither your flocks and herds. It is hard to struggle against nature. To make the culture of grain the primary and leading object, while nature clearly points to another and better way, is little else than rebellion against her sovereign mandates.

It is my opinion that you have not given that attention which your interest requires to the breeding, rearing, and proper use and management of live stock. I did not see about you such specimens of fine stock, especially young stock, as would have been pleasing in my sight. Yet I do not intend to single you out as the only delinquent. It did not appear that your fellow citizens in general had done better, in this respect than yourself. In regard to the husbandry of domestic animals, the whole country around you is behind what it should be, and far behind its own interest.

Good breed is the first requisite towards good husbandry, in regard to live stock. The rule noticed in one of my preceding letters, that the more perfect the parents are, the more perfect the offspring or progeny may be expected to be, applies certainly no less to animal than to vegetable tribes. A particular regard to the principles of this rule is absolutely essential to successful enterprise in the husbandry of live stock. Yet it is believed few good rules for the regulation of human agency are less regarded. By many it seems to be considered as a matter of indifference what animals, whether good or bad, are employed for the propagation of their species. Very inferior animals are often employed for that purpose, and it rarely fails that the consequences are just such as should have been expected—a degenerate and worthless race

of animals. I know not to what extent you and your fellow citizens have practised such indiscretions. I regret, however, to say, that the specimens of live stock which I saw in that vicinity, did not afford satisfactory evidence, that the general practice there had been in these respects altogether unrebukable. To excite in your own mind, and among your neighbors and fellow citizens, proper inquiries relative to the importance of entering more deeply than has been done in that place into the husbandry of domestic animals, and of practising therein according to the principles of economy, is the object at which I am aiming while I write this letter.

It has been suggested, that the first step to be taken towards improvement in the branch of husbandry now under consideration, is to procure good breeds of animals. This is a fundamental concern, and it is scarcely possible to attach to it greater importance than justly belongs to it. Will not the farmers who compose that respectable agricultural community with which you are connected, agree to act in concert for the accomplishment of a revolution in their practice, in conformity to plans herein suggested? Owing to the liberality and practical enterprise of sundry public spirited gentlemen, the best breeds of European stock have already been introduced among us, and are now to be found in almost all parts of the country. It is, I believe, universally admitted, that these breeds, some of them at least, go far ahead, in point of excellence, of any thing that can be found among our own native breeds.

Do you, or do your fellow citizens, desire to become possessed of one of the best breeds of cattle, or the very best that ever grazed in the pastures of any country? I apprehend you need not travel far abroad to find such a breed. Certainly you need not go for that purpose much beyond Buffalo, perhaps not half that distance. Lewis F. Allen, Esq. of the city just named, supposed to be one of the best judges of live stock, has taken unwearied pains to procure the best breeds of cattle. We are credibly informed that he has been successful in his enterprise. It is believed that gentleman has now in his possession on Grand Island several fine bullocks of the improved Durham Short Horned breed, graded differently as to blood, which he will dispose of to his fellow citizens on fair terms. Many other gentlemen in Western New York, and other parts of the same State, are also in possession of highly improved breeds of cattle. But why speak of N. York, as if good breeds of cattle could be found only in that State? Good breeds and good breeders of cattle abound in your own State no less, to say the least, than in any other.

Since then, there are in the country, and not far from you, the best breeds of cattle, can it be supposed that you, and your agricultural neighbors, are doing yourselves justice while you neglect to become interested in them? If gentlemen who understood their own interest, have thought it an object worthy of their attention to send to Europe for good breeds of live stock, is it no object to you to avail yourselves of such breeds, when they are brought near to you, and can be obtained at a trifling expense? It does not appear that farmers in general consider as they should, how great the difference in value is between bad and good, or inferior and superior stock. They are inclined rather to estimate the value of their stock according to its numerical amount, counting the number of animals of which it is composed. This is a fallacious rule of estimating. It should be considered that a single animal of superior breed and excellence, may be worth more for the market, than some dozens of such as generally compose the stocks of this country. For illustration of this remark, I refer you to a recent sale of cattle in the State of Kentucky, published in the Genesee Farmer, current vol., No. 5. It will be seen that a single heifer calf, 8 or 9 months old, was sold for $295. One cow was sold for $300, and several others nearly as high. It is true, these were breeding prices, and if the cattle had been sold for other uses, such prices could not have been sustained. Nor is it to be expected, that when cattle of the best breeds shall have become plenty in the country, such prices can be sustained even for breeding. Yet the difference in value between inferior and superior animals, will always be very great.

It is believed my object in making the preceding remarks cannot be mistaken. I have been laboring to convince you, and that cluster of farmers with whom you are connected, that effectual measures should be taken to improve your breeds of live stock. I am not, unaware, however, that neither yourself, nor any other individual in the neighborhood to which you belong, may have money to spare for the uses that have been suggested, nor be able to spare the time that will be requisite for accomplishing the objects which have been recommended. For such reasons it may be feared my counsels will fail of having their intended effect. Permit me then, further to remark, that farmers have in many respects a common interest, and the better to manage that interest, they would do well, in many instances at least, to form themselves into small associations. Should it become the practice of farmers, *every where*, and in all little farming communities, to form themselves into such associations for the better promotion of their general interest, incalculable advantages would be the results. Such associations should be regularly organized, and have stated periodical meetings for consultation and action on subjects equally interesting to all the members. There should also be rules and by-laws for the better regulation of such associated communities. To every such association a treasury, containing a small amount of public funds, should be considered as an indispensable appendage. If then an association of farmers in the vicinity to which you belong should be formed after the plan here suggested, what useful purposes would it answer? It almost appears to me that the question admits of an amendment, and should be amended so as to read, What useful purpose might it not answer?

At the meetings of such societies, the members might communicate to each other much useful intelligence relative to practical husbandry—suggest plans of improvement—adopt measures for improving their breeds of stock—agree how to practice when their territories are invaded, or threatened with invasion, by pernicious weeds, such as Canada Thistles, Johnswort, Daises and the like. Indeed, the useful purposes to be answered by such associations as have been suggested, are too many to be readily enumerated. It should be known, that while individual effort is feeble, combined action is powerful and irresistible.

To apply the above remarks to the case more particularly in view, it remains for me to say, that the farmers of your neighborhood should agree to act in concert, relative to adopting and pursuing measures for the improvement of their live stock. If no individual is able or willing to assume the expense or take upon himself the responsibility of introducing good breeds of stock, still this should be done by the combined agency of twenty or more farmers. Let a public purse, made up of individual contributions, be provided for this purpose. Let a discreet citizen, who should be a good judge of live stock, be appointed general agent, and let him go abroad in search after good breeds of cattle. By such means let a good bullock be introduced among you—let him be committed to the care and keeping of some one who is known to be a faithful and skilful manager of cattle stock—and let the privileges, profits and expenses, be justly divided among the members of the company.

A Father.

New-York State, March, 1836.

From the Genesee Farmer.

BREAKING AND MILKING COWS.

The proper management of cows to render them gentle and tractable, is a thing of the first importance. The unpleasant consequences of attempting to milk unsubdued and irritable animals,—the loss of a swimming pail of milk,—"the long face, the grave step, an apology and an empty pail,"—it is certainly always desirable to avoid. Even cows of naturally mild and gentle disposition, (for there is a great difference in them, as in almost all animals,) are sometimes completely spoiled by injudicious treatment. Where no system of management is adopted, and where animals are punished for bad conduct, merely as the convenience, caprice or passion of the milker dictates, it is not to be expected that they will improve in manners, or become otherwise than a terror of female, and finally, of male milkers.

Whenever young cows show any thing of a rebellious disposition, the first thing they should be made to feel, is the *superior physical force* of man, in a decided and effectual manner. As soon as this is felt, the animal is overpowered, and prefers surrendering at once to contending further, to manifest detriment. The best way to effect this, is to shut the animal up, and immediately accustom it to handling on every part, speaking to it at the same time in a loud firm voice, a single word at a time, and at intervals. It will thus become familiar to us, and become conscious of superior power. This consciousness will be more strongly produced, if the handling be firm and even rough. An animal should never, for the same reason, be spoken to in a *coaxing* voice, though a kind and soothing tone should always be adopted whenever it manifests submission. If it should show a disposition to resist, as by kicking, the act should be followed *instantaneously* by a *single* stroke of a whip, or other punishment. If this is *invariably* adopted, the animal soon submits, not finding it pleasant or profitable to resist. But never punish an animal unless it can be done instantly after the commission of the offence, and never strike but once; and above all, never get in a passion, for this will certainly spoil the whole. If an animal thus finds that bad behaviour is always followed immediately by punishment, and that submission is always attended with kind treatment, it soon learns to distinguish one from the other; and a change in its manners is wrought in a remarkably short space of time. We have seen cows of several years of age, and apparently of almost incorrigible ferocity, completely metamorphosed in this respect, so as never, for years, to show the slightest

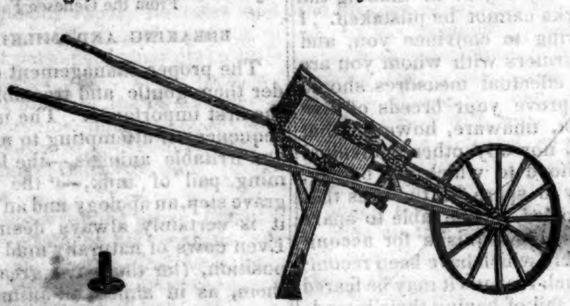
disposition to resist or disobey; but on the contrary, to become even attached to their master. We need not ask how much more humane to the animal, or pleasant to the keeper this is, than where a different course is pursued

It will assist materially in the breaking of young cows, to accustom them to be frequently handled from the first year; and to enable them to acquire a familiarity with the voice and presence of man.

A heifer should never be allowed to have a calf till the early part of summer, or if deferred even until nearly the middle, it will be no detriment. It will then be most vigorous, and there will then be a better supply of nutritious grass for food, which will cause a more perfect enlargement or swelling of the udder. The period of gestation in the cow, is, on an average, two hundred and eighty-seven days, or forty-one weeks, with a bull calf; a cow calf comes one week sooner.

The best cow may be spoiled by not milking clean; too much attention, therefore, cannot be paid to this subject. The udder should be perfectly drained to the very last dripping; for besides the extreme injury ultimately caused to cows by leavnig a part of the milk, the last milk is always far the richest, according to the remark of an experienced Cheshire dairyman, "each succeeding drop the cow gives at a milking excelling the preceding one in richness."

Sore or chapped teats, so common an evil, may be very effectually prevented by washing them perfectly clean with cold water always before milking. Very bad cases have been thus perfectly cured in a few days.



From the Cultivator.

ROBBINS' CORN PLANTER.

Mr. Buel—Sir—Having been applied to by letter, from various sources, for a description of "Robbins' Corn Planter and Drill Barrow," and answers to the following questions solicited, I have concluded, with your permission, to reply through the medium of the Cultivator, should you deem them of sufficient importance to occupy a small space in one of your columns.

Question 1st. "Is Robbins' machine complicated, and liable to get out of repair?" *Answer.* At first view, it would appear rather complicated; but on further inspection and a trial, the complication ceases, and it becomes very simple. There is, however, but one way of placing the band on the pulley, for that must be turned with the sun, *i. e.*, the band should pass from the top of the nave or hub of the large wheel, to the left side of the pully or whir. Particular attention should be paid to this, as, by placing it the opposite way, the wire spring in the small circular box might be injured. The band is shortened or lengthened by twisting or untwisting. The speed may be accelerated or retarded by placing the band on the larger or smaller groove on the nave and whir. By increasing the motion of the droppers, the seed will drop faster, and, of course, nearer together.

2d. "What and how many kinds of seeds will it sow?" *Ans.* It has six droppers, with different sized holes, and will plant corn, beans, peas, broom-corn, beets, mangle wurtzel, turnips, teazles, onions, carrots, mulberry, and all kinds of round or oval seed not larger than corn or beans, with more system and correctness than can be done in the usual manner of planting with the hand and hoe. One man may easily put in five acres in a day, placing the seeds any given distance apart, from two or more inches, and in rows two and an half feet apart one way, and the rows at such distances as may be deemed best. In drills, one or more seeds may be dropped, at eight inches asunder.

3d. "Is it drawn by a horse?" No—it is pushed by a man or boy, like a wheel-barrow, but it is much smaller and lighter.

4th. "Will it answer for planting corn in hills of equal distances, in squares, over a large field?" Yes, it will plant corn in hills, dropping from three to four kernels at a time, two and an half feet apart; and, by a little experience and attention, being particular on starting the rows, the hills may be placed at right angles and at equal distances.

5th. "Will it regulate and drop any required number of seeds?" Yes, by using larger or smaller sized droppers.

6th. "What is the price?" Fifteen dollars.

To plant one acre of ruta baga, the rows twenty seven inches apart, and the seeds in the drill one inch apart, only from four to six ounces of seed is required.

In a letter from a gentleman who has had one of these machines in use for several years, I find the following observation, which I have taken the liberty of transcribing.

"The corn I planted with Robbins' machine, last season, on my farm, exceeded that planted with the hoe, by the acre, at *least fifteen bushels*, under circumstances equally favorable, as to soil and cultivation. And I have conversed recently with a number of gentlemen who have used the machine, and tried some experiments, and find that the result has been in favor of the machine in all cases, they think, *not less* than *ten* bushels."

Such is the description and character of "Robbins' Corn Planter and Drill Barrow," and I know of nothing wanting to make it perfect, except a roller, which I consider of very essential service to cover and press the earth on to the seed, which causes a more rapid vegetation. The roller may be attached by an additional expense of $2.

The above machines may be obtained at the seed store of Wm. Thorburn, No. 347 North Market-street, and of the subscriber, No. 80 State-street, Albany.

C. N. Bement.

Albany, March, 1836.

We have extracted the following notice of the manufacture of Beet Sugar, desiring to bring all the information on the subject before our readers.

We are under the impression that the *white beet*, or *scarcity*, contains moıe sugar and less coloring matter than the *red beet*, the *betterave* of France.

Manufacture of Beet-root Sugar.—We are indebted to Mr. Isnard for the following interesting commuuication, accompanied with a number of documents, which we regret that we have not room to nctice at the present time, any farther than to say that they fully confirm the statements contained in the letter.

Boston, March 28, 1836.

To the Editor of the Daily Advertiser.

Sir,—If you should judge the present communication worthy of attention, it is at your disposal. In order to satisfy yourself concerning the authenticity of my statements I subjoin documents for your perusal, when at leisure.

The manufacture of Sugar of Beet has ceased to be an object of ridicule; the advantages that France draws from it are palpable and great, and the benefits which the manufacturers derive from it are now such that the French Minister of the Treasury has proposed to lay a tax upon it. France owes this new branch of industry to that great man whom she will honor through all time; for, had it not been for his sagacity and powerful assistance, it would have shared the fate of many other improvements lying for ages, or dying in their infancy, once pronounced by ordinary men visionary projects.

The discovery that beet contains a perfect sugar remained for over sixty years without any useful application; many attempts, however, had been made to derive the benefit of it; but those having made these attempts, being rather men of science than men of business, having operated only upon a small scale, with purely scientific views, and having made no calculations, either of expenditures or results, they had no ground to proceed upon. I undertook to solve that problem, and to that effect made, the first in France, an experiment on a large scale, and by a sufficient reward induced a chemist to assist me.

The result of this experiment was transmitted to Napoleon on the 19th March, 1811, and by his order rendered public; and though the birth of his son took place on the 21st of this same month, on the 25th following appeared the decree, a copy of which is among the subjoined documents. By this decree, as you will perceive, he created six experimental factories for the manufacturing of sugar; he appointed me the director of one of them, which factory he gave to me in property, as a reward for my labor, and for having (*perfectionne*) improved the process for obtaining the sugar of beet. Such was my zeal, that my factory in the fall of 1813 was prepared, and all the beet raised by me, or contracted for, so as to produce 1500 lbs. a day of brown sugar, and the

same refined. The first entry of the allies into France caused the total ruin of my establishment. Up to 1816 political events were unfavorable for sugar making, but from that year this manufacture was resumed, and has since never ceased to increase and improve; it is now computed that over 300 such manufactories exist, producing together yearly about from 18 to 20 millions of pounds of brown sugar.

Now, sir, since the making of sugar of beet begins to attract the attention of some agriculturists of the country, I deem it of interest for them, and to gratify the curiosity of others, here to state what were the calculations made in France in 1832, (the latest date of my information,) and add a few observations respecting the benefits one may derive by the mere culture of beets in this country. It is generally admitted, viz:

That one ton, (2000 lbs.) of beet delivered at the factory, costs	$3
That the expenses to work one ton of beet for obtaining its sugar, amount	4
That 2000 lbs. beets will yield 100 lbs. brown sugar, costing	$7

Thus one pound of brown sugar, good quality, costs 7 cents.

By a comparison of the expenses of culture in various parts of France, and on various soils and situations, the average expenses of cultivating there the extent of an American acre of land, are as follows:—Rent and taxes, $5 00; ploughing and harrowing, $2 88: manure, $1 93; sowing, 50 cents; weeding and hoeing, $2 40; gathering, $1 60; carting, $2 56; farmer's profit, $4. Making a total of $21 47.

The produce varies according to the quality of the soil, the quantity of manure used, and the care bestowed on the culture—as we have taken the average of the expenses, so we must take the average of the produce, which is of 7 tons. Some lands yield as much as 15 tons.

The four dollars profit the French farmer derives from this culture, on every acre, is far from being the only one; the others are,

1st. The good state in which the field is left after gathering the beets—no further manure being wanted for the succeeding crop, which crop experience has proved to be always more abundant and of a better quality when succeeding the culture of beets, owing to the destruction of the noxious weeds removed by weeding the beets when young, and prevented from growing, by the thick foliage of the beet when strong.

2d. The facility afforded the cultivator to apply to the culture of beet lands, which he formerly let lie fallow, and consequently, without any additional expenses of rent and taxes, deriving as good a revenue from this land as from any other producing the most.

3d. The advantages the cultivator derives by the purchase from the manufacturer of the pumice of beet at a price not higher than beets, when experience has proved this pumice is worth for him fifty per cent. more; for in fact it is after all but beet deprived of two thirds of water, and consequently a more nourishing food for his cattle, perfectly fitted for fattening them, producing wonders in that respect, which could not be expected from beets in their natural state.

The following is a statement of the receipt and expenditure of a sugar establishment, as reported to the Society for the Encouragement of Manufactures in France. The whole work was performed in 91 days.

Purchase of 500 tons of beet, delivered at $3 20,		$1600 00
1638 days work of men, at 20s., 455 do. of women, at 12s., 364 do. of children, at 5s.,		400 40
For extra working during the night,		109 20
40 cubic feet wood for fuel daily, (28 cords 3-100 at $16 7-100 per cord,)		473 20
Sundry materials for manufacturing purposes,		813 60
Food for 18 oxen used in the mill,		163 60
Interest on $3000 at 15 per cent. for wear and tear,		450 00
Rent for buildings,		120 00
Total,		4130 00
Deduct for molasses sold for	$320	
125 tons pumice at $3 20,	400	
Value of some materials left,	30	750
Produce of 50,000 lbs. brown sugar at 6 7-10 cents,		$3380 00
Sale of 36,000 lbs. 1st quality, at 15 cents,	$5400	
Sale of 14,000 2nd quality, at 10 cents,	1400	6800
Profit,		$3420 00

Should this notice be favorably received, I have at your disposal a few particulars respecting the cultivation of beets.

I am respectfully, sir,
your most obd't. serv't.,
MAX'N ISNARD.
French Vice Consul for Boston.

HINTS ON GRAFTING.

J. BUEL, ESQ.—If you deem the following hints on grafting of any practical utility, they are at your service, the whole, or any part of them.

The method which I have practised, with excellent success, for eight years past, is as follows. I cut my cions as late in April as they can be, before the buds begin to swell, and keep them with the but ends in the earth, in a damp cellar. When the season commences for setting, which is as soon as the leaves begin to start, I set my grafts. I use a composition of two parts rosin, one of beeswax, and one of tallow, melted in a small kettle, and applied hot, with a small brush, which any one can make in five minutes, nicely painting over the end of the branch cut off, so as to cover the split, and prevent the air or wet from getting in. By this method, one can set much faster than in the usual way of applying the composition cold—it requires less of it, and of apples or pears, not more than from five to ten per cent. need be lost. On other fruits I have not had much experience, but from what I have, believe it will succeed equally well. Respectfully,

LEVI HOPKINS.

Mentz, March 8, 1836.

CORN BREAD.

BY ELIZA.

If the editor of the Genesee Farmer will permit me to occupy a small space in his valuable journal, I will take the liberty to communicate one or two modes to make corn bread. They may be interesting to some of its fair readers, and peradventure assist them to give more variety to the cheer of the domestic board.

SNOW BREAD.

This is made by taking a quart of corn flour, and mixing intimately with it a table spoonful of lard. Then take two full quarts of snow and stir it well in the flour with a spoon; pack it close in the pan or oven in which it is to be baked, and submit it to a quick fire. If managed successfully, it will be found to be a far better article of its kind, than the famous *snow soap*, which attracted so much of the attention of our good housewives some years ago. It is exceedingly light and spongy, and will require nearly three quarters of an hour to bake.

CORN ROLLS.

Take a quart of meal, a spoonful of lard, and two spoonfuls of yeast; mix with warm water until the dough is quite soft. Set it in a warm place at night to rise, and bake it in a pan or in cakes in an oven for breakfast. Both this and the snow bread bake very well in a stove.

ELIZE.

Virginia, 3 mo. 1.

During the months of December and January last, the average number of persons who passed from Brussels to Malines, by the Railroad, was never under 800 every day. The total number of passengers in December was more than 28,000, in January more than 29,000; this will probably be surpassed in the present month.

The Augsburg Gazette states that it has received tidings up to the 3d of March from Patras, which contradict the rumors of an insurrection in Greece. Four hundred Klopths in order to escape from the Turkish troops had flung themselves on the Greek territory. But the garrison of Missolonghi instantly took up arms and repelled the marauders with loss.

HARTFORD AND NEW-HAVEN

RAILROAD.

From New-Haven to Meriden, eighteen miles of this Railroad is now located, and is expected to be ready for contract about the 25th of May. The attention of contractors is invited to this work. A more definite advertisement of the time when proposals are to be received, will hereafter appear.

JAMES BREWSTER, Agent.

New-Haven, April 27, 1836. m16—3t

[Editors to whom this is MARKED, are repuested to give it three insertions, and send their bills to James Brewster, President Railroad Company,

PATENT RAILROAD, SHIP AND BOAT SPIKES.

☞ The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years successful operation, and now almost universal use in the United States, (as well as England, where the subscriber obtained a patent,) are found superior to any ever offered in market.

Railroad Companies may be supplied with Spikes having countersink heads suitable to the holes in iron rails, to any amount and on short notice. Almost all the Railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

*** All orders directed to the Agent, Troy, N. Y., will be punctually attended to.

HENRY BURDEN, Agent.

Troy, N. Y., July, 1831.

*** Spikes are kept for sale, at factory prices, by I. & J. Townsend, Albany, and the principal Iron Merchants in Albany and Troy; J. I. Brower, 222 Water street, New-York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

P. S.—Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufacturing so as to keep pace with the daily increasing demand for his Spikes.

1J23am H. BURDEN.

RAILROAD CAR WHEELS AND BOXES, AND OTHER RAILROAD CASTINGS.

Also, AXLES furnished and fitted to wheels complete at the Jefferson Cotton and Wool Machine Factory and Foundry, Paterson, N. J. All orders addressed to the subscribers at Paterson, or 60 Wall street, New-York, will be promptly attended to.

Also, CAR SPRINGS.

Also, Flange Tires, turned complete.

J8 ROGERS, KETCHUM & GROSVENOR.

NEW-YORK AND ERIE RAILROAD.

TO CONTRACTORS.—Proposals will be received at the Engineer's Office of the New-York and Erie Railroad Company, in the village of Binghampton, on and until the 30th day of June next, for grading 69 miles of the Railroad, from the village of Owego, in Tioga County, to the village of Deposit in Delaware County.

Proposals will also be received at the Engineer's Office, in Monticello, on and until the 11th day of July next, for grading 48 miles of the Railroad through the county of Sullivan, extending from the Delaware and Hudson Canal up the valley of the Neversink, and thence to the mouth of the Callikoon Creek, on the Delaware River.

Plans and profiles of the line above mentioned, staked out in convenient sections, with printed forms of the contracts, will be ready for exhibition at the said offices twenty days before the days of letting above specified.

The Company reserve the privilege of accepting only such proposals as they may deem for their advantage.

New-York, 26th April, 1836.

15—tf JAMES KING, President.

NOTICE TO CONTRACTORS FOR EXCAVATION AND EMBANKMENT.

PROPOSALS will be received at the Office of the Munroe Railroad Company, Macon, Geo., between the 19th and 21st of May next, for Excavating and Embanking the whole of the Railroad from Macon to Forsyth, a distance of 25 miles, embracing much heavy graduation.

For further information, apply to

DANIEL GRIFFIN,
Resident Engineer.
J. EDGAR THOMSON,
C. Engineer.

Macon, March 23th, 1836. 11—5t

CHICAGO LOTS.

NOTICE is hereby given, that on the 20th day of June next, at the Town of Chicago, in the State of Illinois, the following described Property will be sold at Public Auction, to wit:

All the unsold Town Lots in the original Town of Chicago; and also the Town Lots on fractional Section No. Fifteen, in the Township No. Thirty-nine, North of Range Fourteen, East of the Third principal Meridian adjoining the said Town of Chicago. The sale will commence on the said 20th day of June, and will be continued from day to day, until all the Property has been offered for sale or disposed of. This property is held by the State of Illinois for canal purposes, and is offered for sale in conformity to the provision of a Statute Law of the said State, authorizing such a sale. The terms of sale are one-fourth of the purchase money to be paid in advance at the time of sale, and the residue in three annual instalments, bearing an interest of six per centum per annum, payable annually in advance.

Those who are unacquainted with the situation of the above mentioned Property, are informed that those Lots which are described as belonging to the original Town of Chicago, are situated in the best built and business part of the Town. Section Fifteen is a dry ridge, commencing near the harbor, and extending south, one mile, along the shore of Lake Michigan.

By order of the Board of Commissioners of the Illinois and Michigan Canal.

Attest, JOEL MANNING,
Treasurer to said Board.

Chicago, March 17th, 1836. 13—8t

PROSPECTUS

OF VOLUME II. OF THE

CHICAGO AMERICAN,

TO BE PUBLISHED SEMI-WEEKLY.

In proposing to establish a SEMI-WEEKLY paper under the old title, but with extended dimensions, the subscriber acknowledges the favors of the past, and solicits the continued patronage of a liberal public.—The reasons that induced him about a year since to establish his weekly paper, operates with renewed and increasing force in favor of his present design.—He shall endeavor, as it was originally intended, to make his paper American in all things; and by identifying itself with the interests and circumstances of Chicago—which from a recent wildnerness has advanced to a population of thirty-five hundred—and of the rich, extensive, and rapidly developing country of which it is the emporium, he hopes it may "grow with their growth, and strengthen with their strength."

As a record of passing events, curreut literature, of the march of agriculture, commerce and manufactures, and especially of the progress of internal improvements, of which this State, by her recent passage of the act for the construction of the "Illinois and Michigan Canal," has commenced her great and auspicious system, it will aim, as ever, to be accurately and early informed, and thus endeavor to consult alike the tastes and wants of the community with which it is identified. With party, as generally understood, it will have as little to do as possible. Its politics will be the Constitution—its party, the Country.

With this brief explanation of its future course, and his thanks for the more than expected encouragement he has already received, the subscriber again ventures to solicit the continued patronage and extended support of all who may feel an interest in the principles here set forth.

It will be enlarged and otherwise greatly improved, and printed on superior paper, and forwarded to distant subscribers by the earliest mails, enveloped in a strong wrapper.

TERMS.—The AMERICAN will be published SEMI-WEEKLY, at \$4 per annum, if paid at the time of subscribing; \$5 if paid at the expiration of six months, or \$6 if payment is delayed to the end of the year.

*** Any person procuring five subscribers and remitting the pay in advance, will be entitled to a sixth copy gratis, or a deduction of TEN PER CENT.

Persons at a distance remitting a \$5 bill will receive the paper fifteen months.

*** All sums to the amount of \$10 and upwards may be sent through the Post Office, at my expense.

THOS. O. DAVIS.

Chicago, March 25, 1836.

*** Subscriptions and Advertisements for the CHICAGO AMERICAN will be received at the Office of the Railroad Journal, 132 Nassau street, by

D. K. MINOR.

ALBANY EAGLE AIR FURNACE AND MACHINE SHOP.

WILLIAM V. MANY manufactures to order, IRON CASTINGS for Gearing Mills and Factories of every description.

ALSO—Steam Engines and Railroad Castings of every description.

The collection of Patterns for Machinery, is not equalled in the United States. 9—1y

STEPHENSON,

Builder of a superior style of Passenger Cars for Railroads.

No. 264 Elizabeth street, near Bleecker street, New-York.

RAILROAD COMPANIES would do well to examine these Cars; a specimen of which may be seen on that part of the New-York and Harlaem Railroad now in operation. J25tf

☞ THE NEWCASTLE MANUFACTURING COMPANY, incorporated by the State of Delaware, with a capital of 200,000 dollars, are prepared to execute in the first style and on liberal terms, at their extensive Finishing Shops and Foundries for Brass and Iron, situated in the town of Newcastle, Delaware, all orders for LOCOMOTIVE and other Steam Engines, and for CASTINGS of every description in Brass or Iron. RAILROAD WORK of all kinds finished in the best manner, and at the shortest notice.

Orders to be addressed to

MR. EDWARD A. G. YOUNG,
Superintendent, Newcastle, Delaware.

feb 20—ytf

AMES' CELEBRATED SHOVELS, SPADES, &c.

300 dozens	Ames' superior		back-strap Shovels	
150	do	do	do plain	do
150	do	do	do cast steel Shovels & Spades	
150	do	do	Gold-mining Shovels	
100	do	do	plated Spades	
50	do	do	socket Shovels and Spades.	

Together with Pick Axes, Churn Drills, and Crow Bars (steel pointed,) manufactured from Salisbury refined iron—for sale by the manufacturing agents,

WITHERELL, AMES & CO.
No. 2 Liberty street, New-York.
BACKUS, AMES & CO.
No. 8 State street, Albany.

N. B.—Also furnished to order, Shapes of every description, made from Salisbury refined Iron. 4—ytf

ARCHIMEDES WORKS.

(100 North Moor street, N. Y.)

NEW-YORK, February 12th, 1836.

THE undersigned begs leave to inform the proprietors of Railroads that they are prepared to furnish all kinds of Machinery for Railroads, Locomotive Engines of any size, Car Wheels, such as are now in successful operation on the Camden and Amboy Railroad, none of which have failed—Castings of all kinds, Wheels, Axles, and Boxes, furnished at shortest notice.

4—ytf H. R. DUNHAM & CO.

RAILWAY IRON.

95 tons of	1 inch by	½ inch.			FLAT BARS in lengths of 14 to 15 feet, counter sunk holes, ends cut at an angle of 45 degrees, with splicing plates and nails to suit.
200	do	1¼	do	½ do	
40	do	1¼	do	⅜ do	
800	do	2	do	½ do	
800	do	2½	do	½ do	
soon expected.					

250 do. of Edge Rails of 36 lbs. per yard, with the requisite chairs, keys, and pins.

Wrought Iron Rims of 30, 33, and 36 inches diameter for Wheels of Railway Cars, and of 60 inches diameter for Locomotive Wheels.

Axles of 2½, 2¾, 2⅞, 3, 3¼, 3½, and 3¾ inches in diameter, for Railway Cars and Locomotives, of patent iron.

The above will be sold free of duty, to State Governments and Incorporated Governments, and the drawback taken in part payment.

A. & G. RALSTON,
9 South Front street, Philadelphia.

Models and samples of all the different kinds of Rails, Chairs, Pins, Wedges, Spikes, and Splicing Plates, in use both in this country and Great Britain, will be exhibited to those disposed to examine them.

4—d7 1meowr

TO CONTRACTORS.

ENGINEER DEPARTMENT, BALTIMORE AND SUSQUEHANNA RAILROAD COMPANY,
April 25, 1836.

PROPOSALS will be received at this Office until the 10th May, for the graduation and masonry of 20 miles of the Road, including a deep cut at the summit.

This division of the road commences in this State and ends in Pennsylvania; running through a high, healthy country, abounding in cheap provisions.

Satisfactory recommendations must accompany the proposals of those, who are unknown to the undersigned.

ISAAC TRIMBLE,
Chief Engineer.
WM. GIBBS McNEILL,
Consulting Eng

15-tm10